Pacific Marine Science Report 78-6

MANUAL FOR TIDAL CURRENTS ANALYSIS AND PREDICTION

by

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Abstract

This report is intended to serve as a user's manual to G. Godin's tidal current analysis and prediction computer programs. These programs have been revised along lines suggested by Godin and are consistent in their methodology and constituent information with the similarly revised tidal heights package. In addition to describing input and output of the programs, the report gives an outline of the methods used; a full presentation of which can be found in Godin [1972] and Foreman [1977].

Users who wish to receive updates of these programs and manual should send their names, addresses and type of computer used for implementation to the author.

Acknowledgements

The writer wishes to thank Dr. G. Godin for his guidance during the computer program revisions, Mr. J. Taylor, Mr. A. Douglas and Dr. R.F. Henry for their helpful suggestions, Mrs. C. Wallace for assisting in the preparation of the diagrams, and Mrs. S. McKenzie for typing the report.

1. USE OF THE TIDAL CURRENTS ANALYSIS COMPUTER PROGRAM

1.1 General Description

This program analyzes hourly current meter data for a given period of time. Current ellipse parameters and Greenwich phase lags are calculated via a least squares fit method coupled with nodal modulation, for only those constituents that can be resolved over the length of record. Unless specified otherwise, a standard data package of 69 constituents will be considered for inclusion in the analysis; however, up to 77 additional shallow water constituents can be requested. If the record length is such that certain important constituents are not included directly in the analysis, provision is made for inference of the current ellipse, and phase parameters, of these constituents from others. A suitable compensation for the smoothing effect that moving average filters may have had on the data prior to input to this program can be made, and a synthesis of hourly tidal current values, based on the analysis results and in the same units and format as the input, can be obtained during the same run. Gaps within the tidal record are permitted.

1.2 Routines Required

1) MAIN.........reads in some data, controls most of the output, and calls other routines.

2) INPUT........reads in the hourly current data for the desired time period, and checks for errors.

3) UCON.........chooses constituents to be included in the analysis via the Rayleigh criterion.

4) SCFIT2.......finds the least squares fit to an equally spaced time series using sines and cosines of specified frequencies as fitting functions.

5) VUF..........reads required information and calculates the nodal corrections for all constituents.

6) INFER........reads required information and calculates the current ellipse and phase parameters of inferred constituents, as well as adjusting those of the constituent used for the inference.

7) CHLSKY.......solves the symmetric positive definite matrix equation resulting from a linear least squares fit.

8) CDAY.........returns the consecutive day number, from a specific origin, for any given date in the range 1901 to 1999, and vice versa.

9) SCLUP........scales up the least squares fit results to compensate for pre-filtering.

10) OUTPUT.......writes the hourly current data that has been constructed from analysis results, on to storage files.

1.3 Data Input

For a computer run of the tidal currents analysis program, four files or devices are used for data input. File reference number 8 contains the tidal constituent information, file reference number 4 contains tidal station and analysis type details, and file reference numbers 10 and 11 respectively contain the hourly north/south and east/west current components. A listing of the standard constituent information for file reference number 8, and a sample set of input for numbers 4, 10 and 11, are given in Appendices 1 and 2 respectively.

File reference number 8 expects four types of data:

i) One card each for all the possible constituents, NAME, to be included in the analysis along with their frequencies, FREQ, in cycles/hour, and the constituent, KMPR, with which they should be compared under the Rayleigh criterion. The format used is (4X,A5,3X,F13.10,4X,A5). Unless NAME is specifically designated on logical unit 4 for inclusion, a blank data field for KMPR results in the constituent not being included in the analysis. A blank card terminates this data type.

ii) Two cards specifying values for the astronomical arguments SO,HO,PO,ENPO, PPO,DS,DH,DP,DNP,DPP in the format (5F13.10).

SO = mean longitude of the moon (cycles) at the reference time origin.

HO = mean longitude of the sun (cycles) at the reference time origin.

PO = mean longitude of the lunar perigee (cycles) at the reference time origin.

ENPO = negative of the mean longitude of the ascending node (cycles) at the reference time origin.

PPO = mean longitude of the solar perigee (perihelion) at the reference time origin.

DS,DH,DP,DNP,DPP are their respective rates of change over a 365 day period at the reference time origin.

iii) At least one card for all the main tidal constituents specifying their Doodson numbers and phase shift along with as many cards as are necessary for the satellite constituents. The first card for each such constituent is in the format (6X,A5,1X,6I3,F5.2,I4) and contains the following information:

KON = constituent name,

II,JJ,KK,LL,MM,NN = the six Doodson numbers for KON,

SEMI = the phase correction for KON,

NJ = the number of satellite constituents.

A blank card terminates this data type.

If NJ > 0, information on the satellite constituents follows, three satellites per card, in the format (11X,3(3I3,F4.2,F7.4,1X,I1,1X)). For each satellite the values read are:

LDEL,MDEL,NDEL = the last three Doodson numbers of the main constituent subtracted from the last three Doodson numbers of the satellite constituent;

PH = the phase correction of the satellite constituent relative to the phase of the main constituent;

EE = the amplitude ratio of the satellite tidal potential to that of the main constituent;

IR = 1 if the amplitude ratio has to be multiplied by the latitude correction factor for diurnal constituents,

= 2 if the amplitude ratio has to be multiplied by the latitude correction factor for semidiurnal constituents,

= otherwise if no correction is required to the amplitude ratio.

iv) One card specifying each of the shallow water constituents and the main constituents from which they are derived. The format is (6X,A5,I1,2X,4(F5.2,A5,5X)) and the respective values read are:

KON = the name of the shallow water constituent,

NJ = the number of main constituents from which it is derived,

COEF,KONCO= combination number and name of these main constituents.

The end of these shallow water constituents is denoted by a blank card.

File reference number 4 contains five types of data:

i) One card for the variables RAYOPT,OBSFAC,ICHK,INDPR,NSTRP, in the format (F5.2,F10.7,3I5).

RAYOPT = Rayleigh criterion constant value if different from 1.0.

OBSFAC = the scaling factor which will multiply the integer, hourly, current observations, in order to produce the desired units for the final, current ellipse, major and minor, semi-axis lengths. (e.g. if the hourly observations are in mm/sec and the final units are to be ft/sec, then this variable would be set to 0.0032808).

ICHK = 0 if the hourly current component data is to be checked for format errors,

= otherwise if this checking is to be waived.

INDPR = 1 if hourly current component predictions based on the analysis results, are to be calculated and written on to file reference numbers 12 and 13. If there is inference, this parameter value will also give the root mean square residual errors after inference adjustments have been made.

= 0 if no such predictions are desired.

NSTRP = the number of successive moving average filters that have been applied to the original current data.

If NSTRP is greater than zero, then TIMINT and (LSTRP(I),I = 1,NSTRP) will be read on a following card, in the format (F10.5, 10I5), and suitable amplitude corrections will be applied to compensate for the smoothing effect of these filters.

TIMINT = the sampling interval, in minutes, of the original unfiltered record.

(LSTRP(J),J = 1,NSTRP) = the number of consecutive observations used in computing each of the NSTRP moving average filters.

ii) One card for each possible inference pair. The format is (2(2X,A5,F13.10),4F10.3) and the respective values read are as follows.

KONAN & SIGAN = the name and frequency (cycles/hour) of the analysed constituent to be used for the inference.

KONIN & SIGIN = the name and frequency of the inferred constituent.

RPL & RMIN = the respective ratios of KONIN to KONAN, for the positive and negative current amplitude components. The positive amplitude component is 0.5* (major semi-axis length + minor semi-axis length), and the negative amplitude component is 0.5* (major semi-axis length - minor semi-axis length).

ZETAP & ZETAM = the respective positive and negative Greenwich phases for KONAN, minus those for KONIN.

This inference information is terminated by a blank card.

iii) One card for each shallow water constituent, other than those in the standard 69 constituent data package, to be considered for inclusion in the analysis. The Rayleigh comparison constituent is also required and the additional shallow water constituent must be found in data type i) of file reference number 8, but have a blank data field where the Rayleigh comparison constituent is expected. The format is (6X,A5,4X,A5) and a blank card is required to terminate data of this type.

iv) One card in the format (2X,4I2,2X,4I2), specifying the following information on the period of the analysis:

IHHA,IDDA,IMMA,IYYA = hour, day, month and year of the beginning of the analysis (measured in time ITZONE of input data v));

IHHB,IDDB,IMMB,IYYB = hour, day, month and year of the end of the analysis period.

v) One card in the format (5X,I4,1X,3A6,A4,A3,1X,2I2,I3,I2) containing the following information on the tidal station:

KSTN = tidal station number,

(NA(J),J=1,4) = tidal station name (22 characters maximum length),

ITZONE = time zone of the hourly observations,

LAD,LAM = station latitude in degrees and minutes,

LOD,LOM = station longitude in degrees and minutes.

If no station latitude is specified, 50°N is assumed for the nodal modulation calculations.

File reference numbers 10 and 11 respectively contain the north/south, and east/west hourly current components. Their input formats are identical, and they are read individually via subroutine INPUT. For convenience, this format has been made similar to that employed by the tidal heights analysis program; however, if an alternative method is preferable, subroutine INPUT and its reference calls may simply be replaced.

Hourly data cards for each of the current components contain the following information, in the format (I1,1X,I5,7X,3I2,12A5).

KOLI = 1 or 2 indicates whether this specific card is the first or second one for that day,

= otherwise indicates a non-data card which is ignored.

JSTN = tidal station number.

ID,IM,IY = day, month and year of the heights on this card.

(KARD(J),J=1,12) = the hourly observations in integer form. The final constituent major and minor semi-axis lengths are in units OBSFAC times those for the hourly observations. Missing values should be specified as a blank field or 99999.

When KOLI = 1, the first hourly observation on the data card is assumed to be at 0100 hr, and when KOLI = 2, it is assumed to be at 1300 hr. Since all Greenwich phase angles are relative to the time zone in which the hourly observations are specified, in order to avoid possible confusion when comparing phases for tidal stations in different zones, it is recommended that observations be recorded in Greenwich mean time.

The hourly observation data cards need not begin and end so as to include exactly the analysis period. Subroutine INPUT ignores data outside this range.

1.4 Output

Four file reference numbers are used for the output of results from the tidal currents analysis program. File 6 is the line printer, 2 is a file that can be used for computer storage of the results, and 12 and 13 respectively contain the north/south, and east/west, hourly current values constructed from the analysis results. 6 and 2 are required by all program runs, whereas the use of 12 and 13 is controlled by input variable INDPR.

If no inference has been performed, the program will produce two pages of results on the line printer. The first of these gives the tidal station name, number, and geographic coordinates; the total number of possible

hourly observations in the analysis period and the total number of hourly observations, excluding gaps, in the analysis period; the starting, middle and end points of the analysis period; the sampling interval of the original data and the filters applied, or an acknowledgement that the original data is assumed to be unfiltered; and the Rayleigh criterion parameter. It also lists the constituents included in the least squares fit; their frequencies in cycles per hour (although eight decimal places are given, depending on computer accuracy, less than this number may be significant); their cosine and sine coefficient values for the X(east/west) and Y(north/south) current components, along with their respective standard deviation estimates, all measured in units OBSFAC (input variable read on file reference number 4) times those for the hourly observations; and for each of the X and Y components, the average and standard deviation of the hourly observations, the root mean square residual error, and the matrix condition number.

The second page repeats the tidal station and analysis period information, and specifies the time zone of the Greenwich phases, and if an inference, and/or scaling compensation for pre-filtering, have been done. It then follows with the list of constituents included in the analysis; their frequencies; their ellipse parameters: the major and minor semi-axis lengths (measured in the same units as the cosine and sine coefficients of the previous page), and the angle of inclination (measured in degrees counterclockwise from east); and the Greenwich phase angles (degrees) for the constitutent current vector and its positively and negatively rotating components.

If inference has been performed in the analysis, then a third page of output is produced that, except for the addition of the inferred constituents and adjustments to those constituents used for the inference(s), is essentially the same as the second page. If hourly current values based on the analysis results are requested, this page also gives the root mean square residual errors after the inference adjustments have been made.

Apart from the omission of some titles, the same information as the second (and third) page(s) of the line printer, is repeated on file number 2. The list of constituent names, major and minor semi-axis lengths, angle of inclination, and the three Greenwich phase lags, begins on line 9 of this file, and is in the correct format for input to the tidal current prediction program, namely (4X,A5,13X,2F8.3,2F7.1).

The north/south, and east/west hourly currents constructed from the analysis results, are written in the same format expected by subroutine INPUT. Values are specified only for the analysis period, including those intervals where there were gaps in the original record, and are in the same measurement units and scaling as the original data.

Appendix 3 lists the final page of line printer output resulting from the input values of Appendix 2.

1.5 Program Conversion, Storage, and Dimension Guidelines

The tidal currents analysis source program and constituent data package described in this manual were tested on the UNIVAC 1106 computer installation at the Institute of Ocean Sciences, Patricia Bay. Although as much of the program as possible was written in basic ASCII FORTRAN, some changes will have to be made before it can be used on other installations. These may include:

i) switching the numeric-character to integer conversion technique in subroutine INPUT from DECODE to a local equivalent, or eliminating the need for this conversion altogether. Were it not for the possibility that gaps within a record might be represented by a blank field rather than 99999 values, the hourly observations could be read in with I5 rather than A5 format. If it were mandatory that all gaps be represented by 99999, then there would be no need to scan the character strings for blank fields, take the appropriate action, and then convert to integer equivalents via DECODE.

ii) deleting some or all REAL*8 declaration statements. These are used either to permit alphanumeric strings longer than 4 characters (which is the ASCII FORTRAN single precision word length) to be read (e.g. constituent names and hourly observations are both read in A5 format), or to gain computational precision in the average, standard deviation, and sine/cosine iteration formula calculations of subroutine SCFIT2. CDC installations should not require double precision variables for either of these cases because their single precision accuracy is about 1.5 times that for IBM and UNIVAC, and their single precision word length of six characters is the maximum alphanumeric string size required by this program.

iii) altering the variable list structure for ENTRY statements and references to them.

iv) changing some, or all, of the file reference, or device, numbers from their present values, in order to conform with local machine restrictions.

v) replacing the intrinsic function INT, used in subroutine OUPUT, or defining a statement function by that name, if it does not have the following definition for your installation:

INT(X) = SIGN(X)*N where N is the largest integer less than or equal to ABS(X).

The program in its present form, requires approximately 6500 and 79000 UNIVAC words, for the storage of its instructions, and arrays respectively. A large part of this is due to X,Y,XP and YP, the arrays of size 9000 each that store the hourly current observations and predictions; and AS, the 170 by 170 matrix resulting from the least squares fit for constituent component amplitudes and phases. If memory requirements are restrictive on a particular installation, array storage can be cut by reducing the dimension of X and Y in the main program to whatever is required for the proposed analysis period; by either similarly reducing XP and YP, or,

if there are to be no predictions, setting their dimension to 2; and by storing only the upper triangle of AS (since it is symmetric) in a one dimensional array. A program version that has this latter storage change can be supplied upon request, however it will have somewhat slower processing times than the one described in this manual (see section 2.2.2 of Foreman [1977] for details).

If additions are made to the standard constituent data package, the dimensions of several arrays may have to be altered. In the event of these or other changes, restrictions on the minimum dimension of all arrays are now given.

Let

M be the total number of possible constituents contained in the data package (at present 146);

MU be the number of constituents considered for inclusion in the analysis (at present 69 + the number of additional shallow water constituents specifically designated for inclusion);

MCON be the number of main constituents in the standard data package (at present 45);

MSAT be the sum of the total number of satellites for these main constituents and, the number of main constituents with no satellites (at present 162 + 8 for the constituent data package containing no third order satellites for both N2 and L2);

and MSHAL be the sum for all shallow water constituents, of the number of main constituents from which each is derived (at present 251).

Then in the main program, arrays NAME,FREQ, and KMPR should have minimum dimension M+1; arrays NAMEU,FU,CX,SX,CY,SY,ERCX,ERSX,ERCY,ERSY,AP,AM, EPSP, and EPSM should have minimum dimension MU; arrays X,Y,XP, and YP should be large enough to contain the hourly current observations (including gaps) and predictions in the proposed analysis period (they are at present set for a maximum of 375 days); array LSTRP should be at least as large as the number of successive moving average filters that were applied to the original current record (at present this is set to 10); and double precision array NA should be large enough to hold the number of characters in the tidal station name (at present 22 characters are expected and the array dimension is 4).

In subroutines SCLUP and UCON, all arrays are passed through the argument list from the main program, and thus need only be dimensioned 2.

In subroutine CDAY, arrays NDP and NDM should have minimum dimension 12.

In subroutine SCFIT2, arrays X,XP,F,C,S,ERC, and ERS are passed in the argument list from the main program and so need only be dimensioned 2; array A should have minimum dimension 2*MU-1 by 2*MU-1; arrays CW,SW, RHSC, and RHSS should have minimum dimension MU; and array RHS should have minimum dimension 2*MU-1. AC and AS should have the same first dimension as A and care should be taken that through their equivalence relationships, neither AC and AS, nor RHSC and RHSS overlap.

In subroutine CHLSKY, because arrays A and F are passed in the argument list from SCFIT2, the first dimension for A must be the same as in SCFIT2, and its second dimension, along with the dimension of F, need only be 2.

In subroutine VUF, arrays KON and NJ should have minimum dimension M+1; arrays VU and F should have minimum dimension M; arrays II,JJ,KK,LL,MM, NN,and SEMI should have minimum dimension MCON+1; arrays EE,LDEL,MDEL,NDEL, IR,and PH should have minimum dimension MSAT; and arrays KONCO and CDEF should have minimum dimension MSHAL+4.

In subroutine INFER, array KON is passed in the argument list from the main program and so need only be dimensioned 2; and arrays KONAN,SIGAN, KONIN,SIGIN,RPL,RMIN,ZETAP, and ZETAM can at present accommodate a maximum of 9 inferred constituents.

In subroutine INPUT, array Z is passed in the argument list from the main program and so need only be dimensioned 2; and arrays KARD and IHT should have a minimum dimension of 12.

In subroutine OUTPUT, arrays XP and YP are passed in the argument list from the main program and so need only be dimensioned 2; array MONTH should have minimum dimension 12; and arrays ICEW and ICNS should have minimum dimension 24.

2. TIDAL CURRENTS ANALYSIS PROGRAM DETAILS

2.1 Representation of Tidal Currents

The following presentation is an amalgamation of those found in Godin [1972, 1976], the unpublished notes of J. Taylor on Godin's method and the associated computer program, and Henry and Foreman [1977].

It is customary in tidal observations to measure the vertical displacement or 'elevation' of the water surface and the horizontal velocity or 'current' at a specified depth. The oscillatory portions of these quantities which can be ascribed to astronomical origins will be referred to, respectively, as tidal heights and tidal currents*.

The decomposition of current observations into north/south and east/west components (where the northern and eastern directions are positive), as is required by this program, is a traditional convenience lending itself to complex variable analysis. The choice of another set of rectangular coordinates would be equally justifiable as long as the positive imaginary axis, Y, is 90° counterclockwise from the positive real axis, X. This condition is satisfied in our case by setting the north/south components as the imaginary parts, and the east/west components as the real parts, of a complex signal Z(t).

Assuming that each of the current components is comprised of an aperiodic constituent, and tidal constituents occurring at the frequencies σ_j, (cycles/hr) for j = 1..M, then the complex signal Z(t) can be expressed as:

$$Z(t) = X_\circ(t) + \sum_{j=1}^{M} X_j \cos 2\pi(\sigma_j t - \phi_j) + i[Y_\circ(t) + \sum_{j=1}^{M} Y_j \cos 2\pi(\sigma_j t - \Theta_j)].$$

Setting $CX_j = X_j \cos 2\pi\phi_j$, $SX_j = X_j \sin 2\pi\phi_j$, $CY_j = Y_j \cos 2\pi\Theta_j$, and $SY_j = Y_j \sin 2\pi\Theta_j$, this signal can be re-expressed initially as:

$$Z(t) = X_\circ(t) + \sum_{j=1}^{M} [CX_j \cos 2\pi\sigma_j t + SX_j \sin 2\pi\sigma_j t]$$

$$+ i\left\{Y_\circ(t) + \sum_{j=1}^{M} [CY_j \cos 2\pi\sigma_j t + SY_j \sin 2\pi\sigma_j t]\right\}$$

and after some algebra as:

$$Z(t) = X_\circ(t) + iY_\circ(t) + \sum_{j=1}^{M} \Big\{[(CX_j+SY_j) + i(CY_j-SX_j)] \exp(2\pi i\sigma_j t)$$

$$+ [(CX_j-SY_j) + i(CY_j+SX_j)] \exp(-2\pi i\sigma_j t)\Big\} /2 \quad .$$

---

*Godin [1972, p.145] used 'tidal stream' to indicate what is here termed 'tidal current'.

Dropping the constituent numbering suffix j and setting

$$a^+ = [(\frac{CX+SY}{2})^2 + (\frac{CY-SX}{2})^2]^{\frac{1}{2}}, \quad a^- = [(\frac{CX-SY}{2})^2 + (\frac{CY+SX}{2})^2]^{\frac{1}{2}},$$

$$\varepsilon^+ = \arctan(\frac{CY-SX}{CX+SY}) \qquad , \text{ and } \varepsilon^- = \arctan(\frac{CY+SX}{CX-SY}),$$

the tidal currents contribution for any constituent is then seen to be

$$Z(t) = Z^+(t) + Z^-(t) = a^+\exp(i\varepsilon^+ + 2\pi i\sigma t) + a^-\exp(i\varepsilon^- - 2\pi i\sigma t)$$

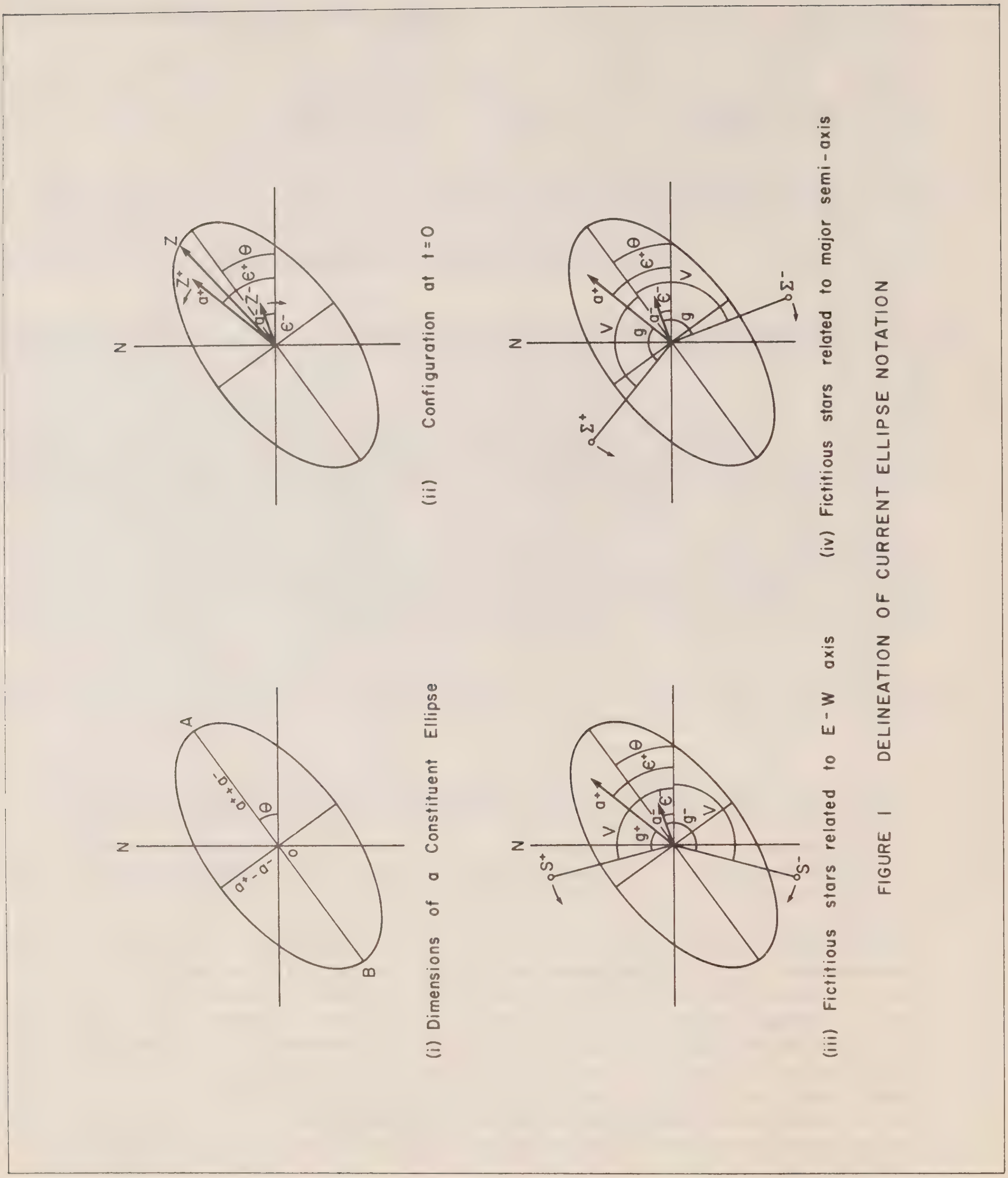
$$= \exp[i(\frac{\varepsilon^+ + \varepsilon^-}{2})] \; [(a^+ + a^-)\cos((\frac{\varepsilon^+ - \varepsilon^-}{2}) + 2\pi\sigma t) + i(a^+ - a^-)\sin((\frac{\varepsilon^+ - \varepsilon^-}{2}) + 2\pi\sigma t)].$$

Examination of the first of these expressions reveals that this contribution consists of two vectors, $Z^+(t)$ and $Z^-(t)$, each rotating at the angular speed of σ cycles per hour. The former vector has length a^+, rotates counterclockwise, and is at ε^+ radians counterclockwise from the positive X (east/west) axis at time t=0; while the latter has length a^-, rotates clockwise, and is at ε^- radians counterclockwise from the positive X axis at t=0 (see Figures 1(i) and 1(ii)). The net rotational effect is that the composite vector Z(t) moves counterclockwise if $a^+ > a^-$, clockwise if $a^+ < a^-$, and linearly if $a^+ = a^-$. From the second expression, it is seen that over a time period of $1/\sigma$ hours, the path of the composite vector traces out an ellipse (or a line segment, in the degenerate case when $a^+ = a^-$) whose respective major and minor semi axis lengths are $a^+ + a^-$ and $a^+ - a^-$, and whose angle of inclination from the positive X axis is $(\varepsilon^+ + \varepsilon^-)/2$ radians.

As an aid to understanding the development and meaning of Greenwich phases for tidal currents, it is convenient to extend the concept of fictitious stars sometimes used in tidal elevation theory. Instead of regarding each tidal constituent as the result of a particular component in the tidal potential, we suppose that each pair of rotating vectors Z^+ and Z^-, is attributable to two fictitious stars which move counterclockwise and clockwise respectively, at the same speed as the constituent in question, around the periphery of a 'celestial disk' tangential to the earth at the measurement site. We suppose also that at time t_o, the angular position of the counterclockwise rotating star, S^+, the star responsible for Z^+, is $V(t_o)$ radians counterclockwise from the positive X (east) axis, where $V(t_o)$ is the same astronomical argument, relative to Greenwich as occurs for this constituent in the tidal potential (Foreman [1977,p.41]). Similarly at the same time, the angular position of the clockwise rotating star, S^-, is assumed to be at $V(t_o)$ radians clockwise from the positive X axis (see Figure 1(iii)). As a consequence, the constant phase angles g^+ and g^-, by which S^+ and S^- lead (or lag) the respective vectors Z^+ and Z^-, can be termed Greenwich phases and are defined by

$$g^+ = V(t_o) - \varepsilon^+$$

$$g^- = V(t_o) + \varepsilon^-.$$



(i) Dimensions of a Constituent Ellipse

(ii) Configuration at t = 0

(iii) Fictitious stars related to E - W axis

(iv) Fictitious stars related to major semi-axis

FIGURE I DELINEATION OF CURRENT ELLIPSE NOTATION

As was previously mentioned, provided that the complex variable condition is satisfied, the choice of a rectangular coordinate system for the original current measurements is arbitrary. Since all angles thus far have been specified with respective to the east/west axis, there is a corresponding arbitrariness in the phases of Z^+ and Z^-. One aim of Godin's analysis is to obtain invariant phases for these vectors by referring angular measurements to a major semi-axis of the constituent ellipse. In order to do this he employs the construction shown in Figure 1(iv), in which the major semi-axis OA of the constituent ellipse is used as the reference axis.

In particular, two different fictitious stars, Σ^+ and Σ^-, are now visualized, similar to S^+ and S^- respectively, except that their angular positions at t=0 are $V(t_o)$ radians from OA in the appropriate directions. This approach has the advantage that the phase of both rotating vectors relative to their respective stars, can now be expressed as a single Greenwich phase angle g, where

$$g = V(t_o) - (\frac{\varepsilon^+ - \varepsilon^-}{2}).$$

Since, from the definitions of the fictitious stars S^+, S^-, Σ^+, and Σ^-, the astronomical argument $V(t_o)$ is identical in all the Greenwich phase expressions, g can be calculated terms of g^+ and g^- as

$$g = \frac{g^+ + g^-}{2} \quad .$$

Interpreted physically, g can be viewed as the interval by which the instant of maximum current (when Z^+ and Z^- coincide along OA) lags the simultaneous transit of the fictitious stars, Σ^+ and Σ^-, at OA.

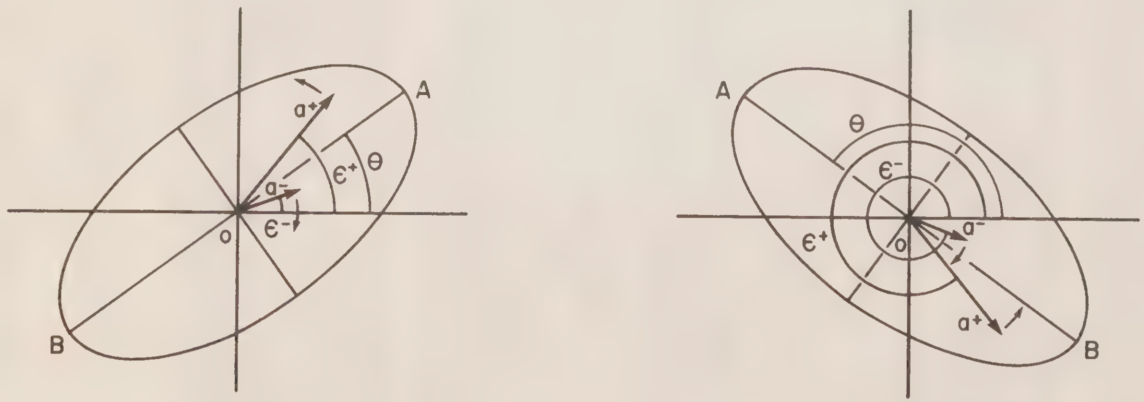
Unfortunately, the factor 2 in the denominators of the expressions for g and Θ can introduce an ambiguity of 180° (= π radians), since any of the angles ε^+, ε^-, g^+ or g^- can be altered by 360° without changing the representation of the original current. In the present revised computer program version, this ambiguity is avoided by imposing the condition that the northern major semi-axis of the constituent always be used as the reference axis. This condition is expressed through the formula

$$\Theta = \frac{\varepsilon^+ + \varepsilon^-}{2} \bmod(180°),*$$

and is illustrated in Figure 2 with the two basically different configurations that can occur. It is equivalent (see Henry and Foreman [1977, Appendix 1]) to the condition imposed in earlier programs, namely

$$0 \leq g^- - g^+ < 360°,$$

* The notation $\phi \bmod(N°)$ indicates that a suitable integer multiple of N is added to or subtracted from ϕ to bring it into the range $0 \leq \phi < N°$.



(i) $\epsilon^+ + \epsilon^- < 360°$, $\theta = \frac{\epsilon^+ + \epsilon^-}{2}$ (ii) $\epsilon^+ + \epsilon^- > 360°$, $\theta = \frac{\epsilon^+ + \epsilon^-}{2} - 180°$

FIGURE 2 DEFINITION OF SEMI-AXIS USED AS REFERENCE AXIS

from which Θ was calculated as $(g^{-}-g^{+})/2$ and g as $(g^{-}+g^{+})/2$.

Figures 3 and 4 show separately, the angular relationships for the two rotating vectors Z^{+} and Z^{-} in cases (i) and (ii) respectively of Figure 2. The following formulae for g^{+} and g^{-}, and the first one specified for g, are used in the present computer program.

$$g^{+} = V(t_{\circ}) - \varepsilon^{+} \bmod(360°),$$

$$g^{-} = V(t_{\circ}) + \varepsilon^{-} \bmod(360°),$$

$$g = g^{+} + \Theta \bmod(360°) = V(t_{\circ}) - \varepsilon^{+} + \Theta \bmod(360°)$$

$$= g^{-} - \Theta \bmod(360°) = V(t_{\circ}) + \varepsilon^{+} - \Theta \bmod(360°)$$

The appearance of Θ in the final expressions for g indicates that if the southern major semi-axis OB should be chosen as reference axis, the consequent change of 180° in Θ produces a similar change in g. This, for example, may occur when comparing the phases, obtained via two analyses at the same tidal station but over different time periods, for a constituent, such as K1 in Appendix 3, whose angle of inclination is near 0° in one case and near 180° in the other. As Godin notes [1976, p.5] though, such a change of the major semi-axis is only in the representation of the constituent ellipse; the ellipse itself is not affected.

From Figures 3 and 4, it can be seen that the maximum current (in the sense that Z^{+} and Z^{-} coincide on OA), occurs at times

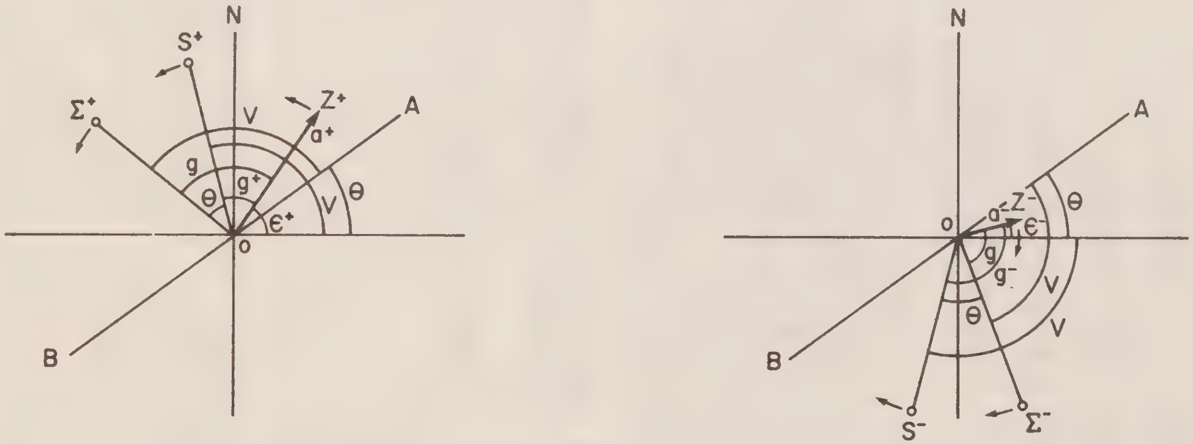
$$t = \frac{g-V(t_{\circ}) + n.360°}{\sigma}, \quad n = \ldots,-1,0,1,\ldots$$

relative to $t=t_{\circ}$.

2.2 The Analysis Solution

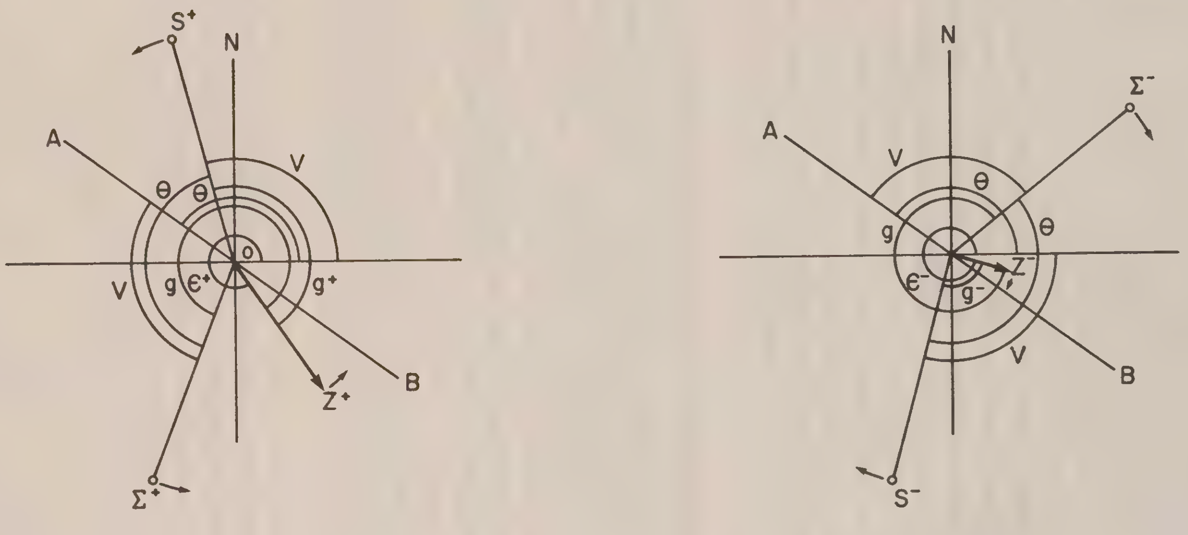
Many of the techniques used in the analysis of tidal currents are the same as those for tidal heights. Rather than repeating here a discussion on topics such as the standard constituent data package (listed in Appendix 1), the formation and solution of the least squares matrices, and the calculations of astronomical and nodal modulation variables, I refer you to the tidal heights analysis manual, Foreman [1977], for details. Instead, a brief description will be given of the steps followed by this analysis program, and references to where method or calculation, details can be found. In order of operation, these steps are as follows.

1. Reading all the input parameters, the tidal constituent data package and the north/south, and east/west current components for the proposed analysis period.
2. Calculation of the middle hour, t_m, of the analysis period.
3. Calculation at time t_m, of the nodal modulation correction factors f and u,



$g = g^{+} + \theta$ $\qquad$ $g = g^{-} - \theta$

FIGURE 3 ANGULAR RELATIONSHIPS WHEN $\epsilon^{+} + \epsilon^{-} < 360°$



$g = g^+ + \theta$ $\qquad$ $g = g^- + (360° - \theta)$

FIGURE 4 ANGULAR RELATIONSHIPS WHEN $\epsilon^+ + \epsilon^- \geq 360°$

and the astronomical arguments V, for all the constituents in the standard data package. Both the data package, and the subroutine that calculates these values, are identical to those used in the tidal heights analysis program.

4. Determination via the Rayleigh criterion, of the constituents to be used in the least squares fits. This criterion, and the list of prospective candidates and their comparison constituents, are again identical to those of the tidal heights method. Tables showing the order of constituent selection, as a function of analysis period length, and in accordance with the Rayleigh criterion, are given in Foreman [1977, pages 19-22].

5. Construction and solution relative to time t_m, of the least squares matrices for each of the X (east/west), and Y (north/south), current components. Except for the additional feature of being able to calculate hourly predictions based on the results of the foregoing analysis, and to recalculate the root mean square residual error; the subroutine employed here is identical to the one for tidal heights. Hence those output variables which give details of the fit, such as error estimates, average, standard deviation, matrix condition number and root mean square residual error; will have been calculated in the same manner. The primary outputs however are the arrays CX, SX, CY and SY, which are described in section 2.1; and, if there is to be no inference, the predicted hourly component currents upon request.

6. Writing the preceding preliminary results on the line printer.

7. If so requested, scaling the CX, SX, CY, and SY values to compensate for the application of moving average filters to the current observations prior to submission for analysis. Section 2.3 has details of this calculation.

8. Conversion of the preliminary results into polar coordinates; i.e. calculation of the parameters a^+, a^-, ε^+ and ε^- as is described in section 2.1.

9. Inference of the a^+, a^-, ε^+ and ε^- values for those designated constituents not included in the least squares fit, and the adjustment of these values for those constituents used for the inference(s). Section 2.4 has details of this operation.

10. Calculation, in accordance with the formulae of section 2.1 and including nodal modulation correction factors and astronomical arguments, of the following ellipse and Greenwich phase parameters: major and minor semi-axis lengths, angle of inclination, g^+, g^-, and g. Note that when the nodal modulation amplitude and phase corrections are included in these formulae, a^+, a^-, and $V(t_\circ)$ respectively become $a^+/f(t_\circ)$, $a^-/f(t_\circ)$, and $V(t_\circ) + u(t_\circ)$.

11. If there has been inference, calculation, upon request, of the hourly predicted component currents based on least squares and inference results. Any scaling that may have been done to compensate for pre-filtering must initially be reversed though, so that the predicted values will have the same scaling as the original input data.

12. Writing all final results without (and with) inference on the line printer and permanent storage file; and, the hourly component predictions, if so requested, on to their files.

2.3 Scaling Compensations for Pre-Filtering

If the sampling interval of data obtained from a current meter is other than one hour, Godin [1972, p.149] recommends that the data be filtered, and the hourly values extracted, before submission to the tidal currents analysis program. Such an operation will eliminate short period fluctuations that are related to turbulence, and of no relevance to tidal analysis. In particular he suggests that if the original data was sampled at n minute intervals, and 60/n is integer valued, say n_o, then the sequence of $A_{n_o}*A_{n_o}*A_{n_o+1}$ moving average be applied if n_o is an even number, and the sequence $A_{n_o}*A_{n_o+1}*A_{n_o+1}$, if n_o is odd.

The definition of the moving average filter A_n is as follows. Suppose that the original time series of observations is $\{z_k\}$, k=1...m, where all the observations are equally spaced in time and m>n. Then the application of A_n results in replacing the former sequence with $\{z_k'\}$, k=1... m-n+1 where

$$z_k' = \frac{1}{n} \sum_{i=k}^{k+n-1} z_i .$$

Assuming that the k^{th} element of the original sequence was recorded at time $(k-1)\Delta t$, then in the new sequence it will be at time $[k-1+(n-1)/2]\Delta t$. Hence not only has there been a loss of n-1 members from the sequence, but a shift of $(n-1)\Delta t/2$ for the times of corresponding elements. This latter point implies that if n is an even number, and the original record included observations on the hour, the filtered record would not have hourly values. Thus a second A_n filter applied to the results of the first, is needed to bring the observation times back into correspondence with those of the original record, and so enable the extraction of hourly values. For example, if the original record has Δt=15 minutes and the first observation is at 1:00 a.m., then after one pass with an A_4 filter, the first observation would be at 1:22:30 a.m., and after a second pass at 1:45 a.m., Δt still being 15 minutes.

When there is a sequence of three filters, the second one is applied to the results of the first, and the third to the results of the second. In particular, the application of $A_n*A_n*A_{n+1}$ requires at least 3n-1 consecutive observations in the original time series, and results in a loss of 3n-2 observations, and a shift in time of $(3n-2)\Delta t/2$.

Unfortunately though, the application of moving average filters will affect the entire spectrum of the observations, not solely the high frequency components that we may wish to remove. The nature of this influence is calculated by Godin [1972, p.54] and summarized as follows.

Given the sequence of numbers $\{f_k\}$, k=0,±1,±2,...[1]; and the set of observations $\{z(j\Delta t)\}$, j=0,±1,±2,...; their convolution is defined to be the sequence

$$\{z_f(j\Delta t)\} = \left\{ \sum_{k=-\infty}^{\infty} f_k z[(j-k)\Delta t] \right\} .$$

---

[1] $k = \pm\frac{1}{2}, \pm\frac{3}{2}, \pm\frac{5}{2}, \ldots$ if the sequence is finite and contains an even number of elements.

If $F(\sigma) = \sum_{k=-\infty}^{\infty} f_k \exp(-2\pi i k \Delta t \sigma)$ is the spectrum of the sequence $\{f_k\}$, then $Z'(\sigma)$, the spectrum of the convoluted values is related to $Z(\sigma)$, the spectrum of the original observations, via the equation $Z'(\sigma) = F(\sigma)\, Z(\sigma)$. Hence a convolution in time is equivalent to a multiplication in frequency.

Now the moving average filter A_n can be defined in terms of a convolution by assigning the following values to the sequence $\{f_k\}$:

$$f_k = \frac{1}{n} \text{ if } -(n-1)/2 \leqslant k \leqslant (n-1)/2$$

$$= 0 \text{ otherwise,}$$

where $k = 0, \pm 1, \pm 2, \ldots$ if n is an odd number, and $k = \pm\frac{1}{2}, \pm\frac{3}{2}, \pm\frac{5}{2}, \ldots$ if n is even. And, making use of the identity

$$\sum_{k=n_0}^{n_1} \exp(ikx) = \frac{\sin\left(\frac{n_1 - n_0 + 1}{2}\, x\right) \exp\left(i\left(\frac{n_1 + n_0}{2}\right) x\right)}{\sin\left(\frac{x}{2}\right)},$$

its spectrum, $F_n(\sigma)$, is calculated as

$$F_n(\sigma) = \sum_{k=-(n-1)/2}^{(n-1)/2} \frac{1}{n} \exp(-2\pi i k \Delta t \sigma)$$

$$= \frac{\sin(n\pi\Delta t\sigma)}{n \sin(\pi\Delta t\sigma)}.$$

Hence one pass of the moving average filter A_n will have the effect of multiplying the response at frequency σ in the original record, by $F_n(\sigma)$. And since it follows that the application of three successive moving average filters, $A_n * A_n * A_{n+1}$, results in a net factor of $F_n(\sigma) \cdot F_n(\sigma) \cdot F_{n+1}(\sigma)$, the scaling compensation required to obtain the amplitude response of the original data at frequency σ, is $1/(F_n(\sigma) \cdot F_n(\sigma) \cdot F_{n+1}(\sigma))$.

2.4 Inference

If the length of a specific tidal record is such that certain important constituents will not be included directly in the analysis, provision is made via the input on file reference number 4, to include these constituents indirectly by inferring their major and minor semi-axis lengths, and Greenwich phase lags, from neighbouring constituents that are included. If suitable amplitude ratios and phase differences can be specified, inference has the effect of significantly reducing any periodic behaviour in the ellipse parameters, and phases, of the constituent used for the inference.

This is due to the removal of interaction from the neighbouring inferred constitutent. If it so happens that a constitutent specified for inference is included directly in the analysis, the program will ignore the inference calculations.

The amplitude ratios and phase differences required for inference calculations should be obtained empirically from the results of longer analyses of data at the same or surrounding stations. Tidal current values are preferable, but tidal heights results may be used as input by setting each of the two amplitude ratios, and the two phase differences, equal to the respective values obtained from the tidal heights analysis. However, Godin [1972, p. 212] warns that the latter technique may fail in the vicinity of an amphidromic point.

If the results of a previous tidal currents analysis are used for calculating the inference variables, and it is decided that the two phase differences should be set equal, namely to the difference in the g values, care should be taken to ensure that the angles of inclination of the two constituent ellipses are reasonably close. If their difference is about 180°, then one value and its corresponding Greenwich phase g should be altered by 180° before calculating the inference phase difference. If this is not done, the subsequent inference adjustments will not have the proper relationship between the constituents, and it may well happen that the root mean square residual error after inference, is higher than before; that is, inference has not improved the fit.

The actual adjustments are as follows. Assume that the constituent with frequency σ_2 is to be inferred from the constituent with frequency σ_1, and that the latters contribution, after conversion of the least squares fit results into polar coordinates (and before nodal modulation), was found to be

$$a_o^+ \exp[\varepsilon_o^+ + 2\pi\sigma_1 t)] + a_o^- \exp[i(\varepsilon_o^- - 2\pi\sigma_1)].$$

And define the following variables for the constituents with frequencies σ_1 and σ_2 respectively:

VU_1, VU_2 = the astronomical argument + nodal modulation phase correction;

$g_1^+, g_1^-, g_2^+, g_2^-$ = the Greenwich phase lags for the counterclockwise and clockwise rotating component vectors;

$a_1^+, a_1^-, a_2^+, a_2^-$ = the amplitudes of the counterclockwise and clockwise rotating component vectors after inference, but before nodal modulation;

f_1, f_2 = the nodal modulation amplitude correction factors;

$A_1^+, A_1^-, A_2^+, A_2^-$ = the amplitudes of the counterclockwise and clockwise rotating component vectors after both inference, and nodal modulation;

$\varepsilon_1^+, \varepsilon_1^-, \varepsilon_2^+, \varepsilon_2^-$ = the initial phases of the counterclockwise and clockwise rotating component vectors.

Then upon setting r^+, r^-, ζ^+, and ζ^- to be the respective variables RPL, RMIN, ZETAP, and ZETAM, that are read from file reference number 4, the following relationships can be seen:

$$r^+ = A_2^+/A_1^+ = (a_2^+ f_1)/(a_1^+ f_2),$$

$$r^- = A_2^-/A_1^- = (a_2^- f_1)/(a_1^- f_2),$$

$$\zeta^+ = g_1^+ - g_2^+ = VU_1 - \varepsilon_1^+ - VU_2 + \varepsilon_2^+,$$

$$\zeta^- = g_1^- - g_2^- = VU_1 + \varepsilon_1^- - VU_2 - \varepsilon_2^-,$$

Letting $\Delta = \sigma_2 - \sigma_1$, the objective of inference can be stated as decomposing the signal found at frequency σ_1, into

$$a_1^+ \exp(i\varepsilon_1^+ + 2\pi i\sigma_1 t) + a_1^- \exp(i\varepsilon_1^- - 2\pi i\sigma_1 t) + a_2^+ \exp(i\varepsilon_2^+ + 2\pi i\sigma_2 t) + a_2^- \exp(i\varepsilon_2^- - 2\pi i\sigma_2 t)$$

$$= \exp(2\pi i\sigma_1 t)[a_1^+ \exp(i\varepsilon_1^+) + a_2^- \exp(i\varepsilon_2^+ + 2\pi i\Delta t)] + \exp(-2\pi i\sigma_1 t)[a_1^- \exp(i\varepsilon_1^-) + a_2^- \exp(i\varepsilon_2^- - 2\pi i\Delta t)]$$

$$= a_1^+ \exp(i\varepsilon_1^+ + 2\pi i\sigma_1 t)[1 + r^+ (\frac{f_2}{f_1}) \exp(i(VU_2 - VU_1 + \zeta^+ + 2\pi\Delta t))] + a_1^- \exp(i\varepsilon_1^- - 2\pi i\sigma_1 t)\ [1 + r^- (\frac{f_2}{f_1}) \exp(i(VU_1 - VU_2 - \zeta^- - 2\pi\Delta t))]$$

Since the constituent with frequency σ_2 was not chosen for inclusion in the least squares analysis, $N \cdot |\Delta| < RAY$, where N is the analysis period length in hours, and RAY is the Rayleigh criteria constant (usually 1.0). Assuming in general that $N \cdot |\Delta|$ is small, good approximations to $\exp(i(VU_2 - VU_1 + \zeta^+ + 2\pi\Delta t))$ and $\exp(i(VU_1 - VU_2 - \zeta^- - 2\pi\Delta t))$, are their average values over the analysis interval [-N/2, N/2], namely,

$[\exp(i(VU_2 - VU_1 + \zeta^+))\sin(\pi\Delta N)]/(\pi\Delta N)$, and

$[\exp(i(VU_1 - VU_2 - \zeta^-))\sin(\pi\Delta N)]/(\pi\Delta N)$ respectively.

Setting

$$T^+ = 1 + [r^+ (\frac{f_2}{f_1}) \exp(i(VU_2 - VU_1 + \zeta^+))\sin(\pi\Delta N)]/(\pi\Delta N),$$

and $$T^- = 1 + [r^- (\frac{f_2}{f_1}) \exp(i(VU_1 - VU_2 - \zeta^-))\sin(\pi\Delta N)]/(\pi\Delta N),$$

the equation relating the tidal signals before and after inference is then,

$$a_o^+\exp(i\varepsilon_o^+ + 2\pi i\sigma_1 t) + a_o^-\exp(i\varepsilon_o^- - 2\pi i\sigma_1 t) = a_1^+\exp(i\varepsilon_1^+ + 2\pi i\sigma_1 t)T^+$$
$$+ a_1^-\exp(i\varepsilon_1^- - 2\pi i\sigma_1 t)T^-$$

Regrouping similar terms in $\sigma_1 t$, this becomes

$$\exp(2\pi i\sigma_1 t)[a_o^+\exp(i\varepsilon_o^+) - a_1^+\exp(i\varepsilon_1^+)T^+] +$$
$$\exp(-2\pi i\sigma_1 t)[a_o^-\exp(i\varepsilon_o^-) - a_1^-\exp(i\varepsilon_1^-)T^-] = 0$$

Now in order to draw some conclusions from this last equation, let us re-express it in the simpler form

$$\exp(it)(w+ix) + \exp(-it)(y+iz) = 0.$$

Expanding and collecting real and imaginary parts here yields

$$(w+y)\cos(t) + (z-x)\sin(t) = 0,$$

and $$(x+z)\cos(t) + (w-y)\sin(t) = 0.$$

Since these equations must hold for all t, it follows that

$w+y = z-x = x+z = w-y = 0$. Hence $w = x = y = z = 0$.

Therefore, setting

$$a_o^+\exp(i\varepsilon_o^+) = w_o + ix_o,$$

$$a_1^+\exp(i\varepsilon_1^+) = w_1 + ix_1,$$

$$a_o^-\exp(i\varepsilon_o^-) = y_o + iz_o,$$

$$a_1^-\exp(i\varepsilon_1^-) = y_1 + iz_1,$$

$$T^+ = c + id \quad ,$$

$$T^- = g + ih \quad ,$$

and applying the result of the simplified equation to the last inference equation, gives

$$w_o - w_1 c + x_1 d = 0,$$

$$x_o - w_1 d - x_1 c = 0,$$

$$y_o - y_1 g + z_1 h = 0,$$

$$z_o - y_1 h - z_1 g = 0.$$

Solving these simultaneous equations for w_1, x_1, y_1 and z_1 yields

$$w_1 = (w_o c + x_o d)/(c^2 + d^2),$$

$$x_1 = (x_o c - w_o d)/(c^2 + d^2),$$

$$y_1 = (y_o g + z_o h)/(g^2 + h^2),$$

and $$z_1 = (z_o g - y_o h)/(g^2 + h^2).$$

Reconstructing these results into polar coordinate form then gives the following adjusted values for the constituent used for inference:

$$a_1^+ = \sqrt{w_1^2 + x_1^2},$$

$$\varepsilon_1^+ = \arctan(x_1/w_1),$$

$$a_1^- = \sqrt{y_1^2 + z_1^2},$$

and $$\varepsilon_1^- = \arctan(z_1/y_1).$$

And finally, making use of the inference assumptions yields the following values for the inferred constituent:

$$a_2^+ = r^+ a_1^+ (f_2/f_1) \quad ,$$

$$a_2^- = r^- a_1^- (f_2/f_1) \quad ,$$

$$\varepsilon_2^+ = \zeta^+ + \varepsilon_1^+ + VU_2 - VU_1 \ ,$$

and $$\varepsilon_2^- = -\zeta^- + \varepsilon_1^- - VU_2 + VU_1.$$

3. USE OF THE TIDAL CURRENTS PREDICTION COMPUTER PROGRAM

3.1 General Description

This program produces tidal current values at a given location for a specified period of time. For each of the tidal constituents to be used in the prediction, the Greenwich phase lag, and the current ellipse major and minor semi-axis lengths and angle of inclination, are required as input. Output can either be the times, magnitudes, and directions of all maximum and minimum currents; or equally spaced values expressed in the form of north/south and east/west components, or vector magnitudes and directions.

3.2 Routines Required

1) MAIN .... reads in tidal station and time period information, ellipse parameters, and Greenwich phases of constituents to be used in the prediction and calculates the desired tidal currents.

2) SLOPE ... calculates for a specific time, the current vector north/south and east/west components, and the derivative of the magnitude squared.

3) ASTRO ... reads the standard constituent data package and calculates the frequencies, astronomical arguments, and nodal corrections for all constituents.

4) PUT ..... controls the output for maximum-minimum predictions.

5) CPUT .... controls the output for equally spaced predictions.

6) CDAY .... returns the consecutive day number from a specific origin for any given date in the range 1901 to 1999, and vice versa.

3.3 Data Input

All input data required by the tidal currents prediction program is read from file reference number 8. A sample set is given in Appendix 4. Although data types i), ii) and iii) are identical to types ii), iii) and iv) expected on file reference number 8 by the analysis program, for completeness they are repeated here.

i) Two cards specifying values for the astronomical arguments SO, HO, PO, ENPO, PPO, DS, DH, DP, DNP, DPP in the format (5F13.10).

SO = mean longitude of the moon (cycles) at the reference time origin.

HO = mean longitude of the sun (cycles) at the reference time origin.

PO = mean longitude of the lunar perigee (cycles) at the reference time origin.

ENPO = negative at the mean longitude of the ascending node (cycles) at the reference time origin.

PPO = mean longitude of the solar perigee (perihelion) at the reference time origin.

DS, DH, DP, DNP, DPP are their respective rates of change over a 365 day period at the reference time origin.

ii) At least one card for all the main tidal constituents specifying their Doodson numbers and phase shift along with as many cards as are necessary for the satellite constituents. The first card for each such constituent is in the format (6X,A5,1X,6I3,F5.2,I4) and contains the following information:

KON = constituent name,

II,JJ,KK,LL,MM,NN = the six Doodson numbers for KON,

SEMI = the phase correction for KON,

NJ = the number of satellite constituents.

A blank card terminates this data type.

If NJ > 0, information on the satellite constituents follows, three satellites per card, in the format (11X,3(3I3,F4.2,F7.4,1X,I1,1X)). For each satellite the values read are:

LDEL, MDEL, NDEL = the last three Doodson numbers of the main constituent subtracted from the last three Doodson numbers of the satellite constituent;

PH = the phase correction of the satellite constituent relative to the phase of the main constituent;

EE = the amplitude ratio of the satellite tidal potential to that of the main constituent;

IR = 1 if the amplitude ratio has to be multiplied by the latitude correction factor for diurnal constituents,

= 2 if the amplitude ratio has to be multiplied by the latitude correction factor for semi-diurnal constituents,

= otherwise if no correction is required to the amplitude ratio.

iii) One card specifying each of the shallow water constituents and the main constituents from which they are derived. The format is (6X,A5,I1,2X,4(F5.2,A5,5X)) and the respective values read are:

KON = the name of the shallow water constituent,

NJ = the number of main constituents from which it is derived,

COEF, KONCO = the combination number and name of these main constituents.

The end of these shallow water constituents is denoted by a blank card.

iv) One card with the tidal station information ISTN,(NA(J),J=1,4),ITZONE, LAD,LAM,LOD,LOM in the format:

(5X,I4,1X,3A6,A4,A3,1X,I2,1X,I2,2X,I3,1X,I2).

ISTN	=	the station number.
(NA(J),J=1,4)	=	the station name.
ITZONE	=	the time zone reference for the 'Greenwich' phases.
LAD, LAM	=	the station latitude in degrees and minutes.
LOD, LOM	=	the station longitude in degrees and minutes.

v) One card for each constituent to be included in the prediction, with the constituent name (KON), major and minor semi-axis lengths (EMAJ and EMIN), ellipse angle of inclination (EINC), and Greenwich phase lag (G) in the format (4X,A5,13X,2F8.3,2F7.1). (This format is compatible with the analysis program results produced on output device 2.) The units of the predicted currents will be the same as those of the major and minor semi-axis lengths, the angle of inclination should be measured in degrees counterclockwise from east, and the phase lag should be measured in degrees relative to the time zone (ITZONE) for which the prediction is desired.

vi) One card containing the following information on the period and type of prediction desired. The format is (3I3,1X,3I3,1X,A4,2X,A4,F9.5).

IDYO,IMOO,IYRO	=	the first day, month and year of the prediction period.
IDYE,IMOE,IYRE	=	the last day, month and year of the prediction period.
ITYPE	=	'EQUI' if equally spaced predictions are desired.
	=	'EXTR' if all the high and low tide times and heights are desired.
IOUT	=	'COMP' if ITYPE = 'EQUI' and north/south and east/west component predictions are desired,
	=	otherwise if ITYPE = 'EQUI' and vector magnitudes and direction predictions are desired, or if ITYPE = 'EXTR'.
DT	=	the time spacing of the predicted values if ITYPE = 'EQUI',
	=	the time step increment used to initially bracket a maximum or minimum value if ITYPE = 'EXTR'.

Equally spaced predictions begin at DT hours on the first day and extend to 2400 hours (assuming 24 is a multiple of DT) of the last day. When ITYPE = 'EXTR', Godin and Taylor [1973] recommend using the following values for DT: 1.5 hours for a semi-diurnal tide, 3.0 hours for a diurnal tide, and 0.25 hours for a mixed tide.

Type vi) data may be repeated any number of times. One blank card following a type vi) record will return the program to type iv) input, while two blank cards will end the program execution.

3.4 Output

Up to four file reference numbers are required for the output of results in the tidal currents prediction program. Device number 6 is the line printer, 10 and 11 are data files for the storage of equally spaced predictions, and 12 is a data file for the storage of maximum and minimum predictions. All information on files 10, 11 and 12 is written on the line printer in the same format. However the line printer also records the station name and location, along with the ellipse parameters and phase lags of the constituents used in the prediction. Appendix 5 lists the output on files 10, 11 and 12 resulting from the input of Appendix 4.

When maximum and minimum current values are desired, the station number, date, and a series of up to four current magnitudes along with their directions and occurrence times, are listed on each record. Two and sometimes three records are required per day, and the format of these variables on file reference number 12 is (1X,I4,I3,2I2,4(I5,F6.2,F6.1)).

When equally spaced currents are requested in component form, file 10 receives the north/south values, and 11 the east/west. If the currents are requested in vector form, the magnitudes are on 10 and the directions on 11. In all cases, 8 values are listed per record preceded by the station number, the time, day, month and year of the first value, and followed by the time increment between values. On both devices, the format for these variables is (1X,I4,F6.2,I3,2I2,8F7.2,F6.2). On the line printer, the component (or vector) values are not listed separately; that is, one record of north/south components (or current magnitudes) is followed directly by the corresponding east/west values (or current directions).

3.5 Program Conversion, Storage and Dimension Guidelines

The source program and constituent data package described in this manual were tested on the UNIVAC 1106 at Patricia Bay Institute of Ocean Sciences. Although the program was written in basic ASCII FORTRAN, there may be some changes needed before the program and data package can be used on other installations. These may include:

i) deleting some or all the REAL*8 declaration statements. Presently these are used only to permit alphanumeric strings longer than 4 characters (which is the ASCII FORTRAN single precision word length) to be read (eg. constituent names are read in A5 format). CDC installations should not require these double precision variables because there are no alphanumeric strings longer than 6 characters (which is the CDC word length) in the program.

ii) switching the trigonometric iteration formulae to double precision in order to maintain accuracy. Tests performed on the UNIVAC demonstrate that this change is not necessary, however on less accurate installations, it may be (UNIVAC real variable single precision has 8.1 significant digits). As a test for machine accuracy, I suggest using the input of Appendix 4 and comparing the results with those listed in Appendix 5. In the event that more precision is needed, the following variables in the main program should be declared REAL*8: COSE,SINE,C,S,CHA,CHB,CHM,

SHA,SHB,SHM,BTWOC,TEMP,X,Y; as well as COSE,SINE,X,Y,PDX,PDY in subroutine SLOPE; and all related assignments and library function calls should be altered accordingly (e.g. '=0.0' should become '0.DO' and SQRT should be DSQRT).

iii) altering the variable list structure for ENTRY statements and references to them.

iv) changing some or all of the logical unit (file reference) numbers from their present values in order to conform with local machine restrictions.

The program in its present form requires approximately 2000 and 13500 UNIVAC words for the storage of its instructions and arrays respectively. As with the analysis program, changing the number or type of constituents in the standard data package may require alteration to the dimensions of some arrays. Restrictions on the minimum dimension of all arrays are now given.

Let

	MTAB	be the total number of possible constituents contained in the data package (at present 146),
	M	be the number of constituents to be included in the prediction,
	MCON	be the number of main constituents in the standard data package (at present 45),
	MSAT	be the sum of the total number of satellites for these main constituents and, the number of main constituents with no satellites (at present 162 + 8 for the constituent data package containing no third order satellites for both N2 and L2);
	MSHAL	be the sum for all shallow water constituents of the number of main constituents from which each is derived (at present 251),
and	NITER	be the number of iterations required to reduce the time interval within which it is known that a high or low tide exists, to a desired length (with the largest initial interval size of 3 hours and a 6 minute final interval, NITER is 5).

Then in the main program, array KONTAB should have minimum dimension MTAB+1; arrays SIGTAB,V,U, and F should have minimum dimension MTAB; arrays KON,EMAJ,EMIN,EINC, and G should have minimum dimension M+1; arrays SIG,INDX, ANGO,CMAJ,CMIN,SMAJ,SMIN,CHA,CHB,CHM,SHA,SHB,SHM,C,S,COSE, and SINE should have minimum dimension M; and the two dimensional array BTWOC should have a minimum dimension of M by NITER. Array COSINE which stores pre-calculated cosine function values over the range of 0° to 450° and is used as a look-up table, at present has 2501 elements.

In subroutine SLOPE, arrays F,CMAJ,CMIN,SMAJ,SMIN,SIG, and INDX are in COMMON and should have the same dimensions as in the main program; and arrays COSE and SINE are passed in the argument list from the main program and

so need only be dimensioned 2.

In subroutine ASTRO, arrays KON and NJ should have minimum dimension MTAB+1; arrays FREQ,V,U, and F should have minimum dimension MTAB; arrays II,JJ,KK,LL,MM,NN and SEMI should have minimum dimension MCON+1; arrays EE,LDEL,MDEL,NDEL,IR, and PH should have minimum dimension MSAT; and arrays KONCO and COEF should have minimum dimension MSHAL+4.

In subroutine PUT, the dimensions of arrays RK,DIRK, and ITIME should be at least as large as the maximum number of extreme current values per day (that is at present assumed to be 18).

In subroutine CPUT, the dimension of arrays X and Y should be at least equal to the number of equally spaced tidal current values per output record (at present, this is 8).

In subroutine CDAY, both arrays NDM and NDP should have dimension 12.

4. TIDAL CURRENTS PREDICTION PROGRAM DETAILS

4.1 Problem Formulation and the Equally Spaced Prediction Method

In section 2.1, we saw that the tidal current contribution for a constituent with frequency σ can be represented as

$$Z(t) = a^{+}\exp(i\varepsilon^{+}+2\pi i\sigma t) + a^{-}\exp(i\varepsilon^{-}-2\pi i\sigma t),$$

where a^{+}, a^{-}, ε^{+} and ε^{-} are calculated from the least squares analysis. After calculation of the astronomical argument and nodal modulation correction factors at an origin, $t_{\circ}$, from which t is measured, and substitution of the phase variables Θ and g, this complex-valued tidal contribution can be re-expressed as

$$\begin{aligned} Z(t) &= f(t_{\circ})a^{+}\exp(i(V(t_{\circ})+u(t_{\circ})-g+\Theta+2\pi\sigma t)) \\ &\quad +f(t_{\circ})a^{-}\exp(i(g-V(t_{\circ})-u(t_{\circ})+\Theta-2\pi\sigma t)) \\ &= f(t_{\circ})\exp(i\Theta)\,[(a^{+}+a^{-})\cos(V(t_{\circ})+u(t_{\circ})+2\pi\sigma t-g) + \\ &\quad i(a^{+}-a^{-})\sin(V(t_{\circ})+u(t_{\circ})+2\pi\sigma t-g)] \end{aligned}$$

Letting $\phi(t,t_{\circ}) = V(t_{\circ})+u(t_{\circ})-g+2\pi\sigma t$, a further re-arrangement into real (east/west) and imaginary (north/south) parts yields

$$\begin{aligned} Z(t) &= f(t_{\circ})\,[(a^{+}+a^{-})\cos\Theta\,\cos\phi(t,t_{\circ}) - (a^{+}-a^{-})\sin\Theta\,\sin\phi(t,t_{\circ})] \\ &\quad + if(t_{\circ})\,[(a^{+}+a^{-})\sin\Theta\,\cos\phi(t,t_{\circ}) + (a^{+}-a^{-})\cos\Theta\,\sin\phi(t,t_{\circ})] \end{aligned} \tag{1}$$

The actual procedure then used to produce equally spaced tidal current predictions is almost identical to that employed in tidal heights prediction (Foreman [1977, p.58]). Since the data package read from file reference number 8 does not contain constituent frequencies, they must be calculated via the astronomical variable derivatives and the constituent Doodson numbers. f, u and V values are then calculated for 000 hr of the 16th day of the first month of the desired prediction period, and updated as required, for subsequent months. Tidal current components are then found by summing the contributions from each constituent.

In order to avoid calling a trigonometric library function for each new value of t, when a sequence of equally spaced predictions is required, the following formulae are used for each constituent contribution:

$$\cos(\psi+2\pi\sigma(n+1)\Delta t) = \cos(\psi+2\pi\sigma n\Delta t)\,\cos(2\pi\sigma\Delta t) - \sin(\psi+2\pi\sigma n\Delta t)\,\sin(2\pi\sigma\Delta t), \tag{2}$$

$$\sin(\psi+2\pi\sigma(n+1)\Delta t) = \sin(\psi+2\pi\sigma n\Delta t)\,\cos(2\pi\sigma\Delta t) + \cos(\psi+2\pi\sigma n\Delta t)\,\sin(2\pi\sigma\Delta t), \tag{3}$$

where $\psi = V(t_{\circ})+u(t_{\circ})-g$.

4.2 The Maximum and Minimum Current Prediction Method

Letting X and Y be the east/west and north/south current components respectively, it is easily seen that the times for which the current magnitude, namely $\sqrt{X*X+Y*Y}$, will attain a maximum or minimum value will be the same as those for the magnitude squared, namely X*X+Y*Y. Therefore, we can find all maximum and minimum currents by solving the equation that results from setting zero equal to the derivative with respect to time, of the magnitude squared.

Expanding equation (1) of 4.1 to include the contributions from m constituents, this result may be written as

$$D(t) = \sum_{j=1}^{m} [X_j(t,t_\circ)\frac{d}{dt} X_j(t,t_\circ) + Y_j(t,t_\circ)\frac{d}{dt} Y_j(t,t_\circ)] = 0;$$

where for each constituent

$$X(t,t_\circ) = f(t_\circ)[(a^+ + a^-)\cos\Theta \cos\phi(t,t_\circ) - (a^+ - a^-)\sin\Theta \sin\phi(t,t_\circ)],$$

$$\frac{d}{dt} X(t,t_\circ) = -2\pi\sigma f(t_\circ)[(a^+ + a^-)\cos\Theta \sin\phi(t,t_\circ) + (a^+ - a^-)\sin\Theta \cos\phi(t,t_\circ)],$$

$$Y(t,t_\circ) = f(t_\circ)[(a^+ + a^-)\sin\Theta \cos\phi(t,t_\circ) + (a^+ - a^-)\cos\Theta \sin\phi(t,t_\circ)]$$

and $\frac{d}{dt} Y(t,t_\circ) = 2\pi\sigma f(t_\circ)[-(a^+ + a^-)\sin\Theta \sin\phi(t,t_\circ) + (a^+ - a^-)\cos\Theta \cos\phi(t,t_\circ)].$

The method employed to solve this equation is similar to the one used in the prediction of high and low tidal heights (Foreman [1977, p.61]). We first bracket all extrema by moving forward in time with steps of size Δt, and comparing signs of the interval endpoints. Once an interval whose endpoints differ in sign has been found, the zero value is located via the method of bisection coupled with linear interpolation.

Because each tidal constituent has two maximum and two minimum values per cycle, as opposed to one of each in the case of tidal heights, the recommended step size values, Δt, are one half of those listed in the tidal heights manual (Foreman [1977, p.64]) namely:

i) Δt = 1.5 hours for semi-diurnal tide,

ii) Δt = .25 hours for mixed tide,

iii) Δt = 3 hours for diurnal tide.

Determination of the tidal nature at a particular station may be obtained by calculating the diurnal to semi-diurnal ratio of tidal height amplitudes for the major constituents M2, S2, K1, and O1. This value is called the form number (Dietrich [1963]) and is defined precisely as

$$F = \frac{K1+O1}{M2+S2} .$$

The tide is then said to be

i) semi-diurnal if $0 \leq F \leq .25$

ii) mixed if $.25 < F \leq 3.00$

iii) diurnal if $F > 3.00$.

If tidal heights analysis results are not available, F may be approximated using either the X or Y component amplitudes (e.g. using the notation of 2.1, the X component amplitude is $\sqrt{CX*CX+SX*SX}$). For Race Rocks, the example used in Appendix 4, the east/west and north/south components both yield F values of 0.7.

In more detail, the search algorithm for an extremum is then as follows:

i) move forward in time from the origin, or the last extremum, in steps of Δt until either a change in sign exists between the derivative values at the endpoints of the interval (t_a,t_b), or t_b extends beyond the desired prediction period. Each constituent contribution in the summation, D(t) is evaluated by equations (2) and (3) of 4.1. When an interval containing an extremum is located, set k = 1 and proceed to ii).

ii) calculate $t_k=t_a + \Delta t/2^k$, and for each constituent in the sum, evaluate $D(t_k)$ by using the formulae:

$$\sin(t_k) = (\sin(t_a) + \sin(t_b))/(2 \cos \Delta t/2^k)),$$

$$\cos(t_k) = (\cos(t_a) + \cos(t_b))/(2 \cos \Delta t/2^k)).$$

If $|D(t_k)| \leq 10^{-16}$, set $D(t_k) = 10^{-16}$.

iii) re-assign whichever of t_a or t_b has the same derivative sign as $D(t_k)$, by t_k. If the new interval length t_b-t_a is less than .1 hours, proceed to iv). Otherwise set k = k+1 and return to ii).

iv) use the following linear interpolation formula to find the extremum t_E,

$$t_E = t_a + D(t_a)(t_b-t_a)/(D(t_a)-D(t_b)),$$

and evaluate the X (real) and Y (imaginary) components of the current at this time via summing the respective constituent contributions given in equation (1) of 4.1. For each one, obtain the required sine and cosine values by using a pre-calculated stored table of 2501 cosine values with arguments in the range of 0° to 450°. The current magnitude is then $\sqrt{X*X+Y*Y}$ and its direction measured counterclockwise from east is arctan(Y/X). Return to i).

5. CONSISTENCY OF THE ANALYSIS AND PREDICTION PROGRAMS AND ACCURACY OF THEIR RESULTS IN RELATION TO THE METHODS EMPLOYED

As in the case of the tidal heights analysis and prediction programs, there is one noteworthy inconsistency between the tidal currents analysis and prediction programs. In particular, if a pseudo-tidal record were synthesized by the prediction program and analysed using the same constituents, the ellipse parameter and phase results given by the analysis program would not be identical to those used as input for the prediction program.

In a small part, this discrepancy is due to round-off accumulated during the calculations and truncation of the synthesized values to conform to input and output formats. However a test performed on the UNIVAC 1106 at Patricia Bay with a six month period of synthesized hourly currents indicates that such errors occur no sooner than the fourth digit. The remainder of the difference (which is, at worst, in the third digit) can be attributed to different approximating assumptions for the calculation of f and u, the nodal and modulation amplitude and phase correction factors. Whereas the prediction program calculates these values at the 16th day of each month in the desired time period and keeps them constant throughout the entire month, the analysis program assumes them to be constant over the entire analysis period and equal to their true values at the central hour of that period. However, if so desired, synthesized values in which the calculation of the nodal modulation factors is consistent with that of the analysis method can be obtained from the analysis program via setting input variable INDPR to 1.

As would be expected, the inaccuracy in the nodal modulation calculation for periods longer than two months is worse in the case of the analysis method, and becomes more significant as the analysis period increases. In fact there exists an optimal period length, which Godin estimates to be approximately one year, beyond which the expected accuracy improvement through better resolution of the constituents is overshadowed by this and other nodal modulation assumptions. In particular once the record length is near nine years, nodal modulation in its present form breaks down because some constituents, normally considered as satellite, should be resolved directly.

It is also important to note that significantly different results can be expected in a synthesis/analysis test if there is at least one more constituent used in the synthesis than the analysis. This is because the least squares fit technique will adjust the ellipse parameters and phases of constituents included in the analysis to partially account for contributions due to constituents included in the synthesis but not the analysis. In fact even after the extra constituents have been inferred (e.g. P1 is included in the synthesis and in the analysis via inference from K1) there will still be some discrepancies in the results not only for the inferred and inferree constituents due to small inaccuracies in the approximating inference assumptions, but also for neighbouring constituents whose least squares fit results were affected by the presence of the inferred constituent but whose final results were not adjusted, as were those of the inferree, during inference (e.g. the presence of P1 affects not only

K1 but to a lesser extent neighbouring constituents such as NO1 and J1). However, except for round-off and truncation errors, and the slightly different f and u values, having more constituents in the analysis than the synthesis will not affect the results.

APPENDIX 1

Standard Constituent Input Data for the Tidal Currents Analysis Computer Program. This data is read by file reference number 8.

Z0	0.0	M2
SA	0.0001140741	SSA
SSA	0.0002281591	Z0
MSM	0.0013097808	MM
MM	0.0015121518	MSF
MSF	0.0028219327	Z0
MF	0.0030500918	MSF
ALP1	0.0343965699	2Q1
2Q1	0.0357063507	Q1
SIG1	0.0359087218	2Q1
Q1	0.0372185026	O1
RHO1	0.0374208736	Q1
O1	0.0387306544	K1
TAU1	0.0389588136	O1
BET1	0.0400404353	NO1
NO1	0.0402685944	K1
CHI1	0.0404709654	NO1
PI1	0.0414385130	P1
P1	0.0415525871	K1
S1	0.0416666721	K1
K1	0.0417807462	Z0
PSI1	0.0418948203	K1
PHI1	0.0420089053	K1
THE1	0.0430905270	J1
J1	0.0432928981	K1
2PO1	0.0443745198	
SO1	0.0446026789	OO1
OO1	0.0448308380	J1
UPS1	0.0463429898	OO1

ST36	0.0733553835	
2NS2	0.0746651643	
ST37	0.0748675353	
ST1	0.0748933234	
OQ2	0.0759749451	EPS2
EPS2	0.0761773161	2N2
ST2	0.0764054753	
ST3	0.0772331498	
O2	0.0774613089	
2N2	0.0774870970	MU2
MU2	0.0776894680	N2
SNK2	0.0787710897	
N2	0.0789992488	M2
NU2	0.0792016198	N2
ST4	0.0794555670	
OP2	0.0802832416	
GAM2	0.0803090296	H1
H1	0.0803973266	M2
M2	0.0805114007	Z0
H2	0.0806254748	M2
MKS2	0.0807395598	M2
ST5	0.0809677189	
ST6	0.0815930224	
LDA2	0.0818211815	L2
L2	0.0820235525	S2
2SK2	0.0831051742	
T2	0.0832192592	S2
S2	0.0833333333	M2
R2	0.0834474074	S2
K2	0.0835614924	S2
MSN2	0.0848454852	ETA2
ETA2	0.0850736443	K2
ST7	0.0853018034	
2SM2	0.0861552660	
ST38	0.0863576370	
SKM2	0.0863834251	
2SN2	0.0876674179	
NO3	0.1177299033	
MO3	0.1192420551	M3
M3	0.1207671010	M2

NK3	0.1207799950	
SO3	0.1220639878	MK3
MK3	0.1222921469	M3
SP3	0.1248859204	
SK3	0.1251140796	MK3
ST8	0.1566887168	
N4	0.1579984976	
3MS4	0.1582008687	
ST39	0.1592824904	
MN4	0.1595106495	M4
ST9	0.1597388086	
ST40	0.1607946422	
M4	0.1610228013	M3
ST10	0.1612509604	
SN4	0.1623325821	M4
KN4	0.1625607413	
MS4	0.1638447340	M4
MK4	0.1640728931	MS4
SL4	0.1653568858	
S4	0.1666666667	MS4
SK4	0.1668948258	S4
MNO5	0.1982413039	
2MO5	0.1997534558	
3MP5	0.1999816149	
MNK5	0.2012913957	
2MP5	0.2025753884	
2MK5	0.2028035475	M4
MSK5	0.2056254802	
3KM5	0.2058536393	
2SK5	0.2084474129	2MK5
ST11	0.2372259056	
2NM6	0.2385098983	
ST12	0.2387380574	
2MN6	0.2400220501	M6
ST13	0.2402502093	
ST41	0.2413060429	
M6	0.2415342020	2MK5
MSN6	0.2428439828	
MKN6	0.2430721419	
ST42	0.2441279756	

2MS6	0.2443561347	M6
2MK6	0.2445842938	2MS6
NSK6	0.2458940746	
2SM6	0.2471780673	2MS6
MSK6	0.2474062264	2SM6
S6	0.2500000000	
ST14	0.2787527046	
ST15	0.2802906445	
M7	0.2817899023	
ST16	0.2830867891	
3MK7	0.2833149482	M6
ST17	0.2861368809	
ST18	0.3190212990	
3MN8	0.3205334508	
ST19	0.3207616099	
M8	0.3220456027	3MK7
ST20	0.3233553835	
ST21	0.3235835426	
3MS8	0.3248675353	
3MK8	0.3250956944	
ST22	0.3264054753	
ST23	0.3276894680	
ST24	0.3279176271	
ST25	0.3608020452	
ST26	0.3623141970	
4MK9	0.3638263489	
ST27	0.3666482815	
ST28	0.4010448515	
M10	0.4025570033	
ST29	0.4038667841	
ST30	0.4053789360	
ST31	0.4069168759	
ST32	0.4082008687	
ST33	0.4471596822	
M12	0.4830684040	
ST34	0.4858903367	
ST35	0.4874282766	

.7428797055	.7771900329	.5187051308	.3631582592	.7647990160	000GMT 1/1/76
13.3594019664	.9993368945	.1129517942	.0536893056	.0000477414	INCR./365DAYS

```
Z0        0  0  0  0  0  0 0.0    0
SA        0  0  1  0  0 -1 0.0    0
SSA       0  0  2  0  0  0 0.0    0
MSM       0  1 -2  1  0  0  .00   0
MM        0  1  0 -1  0  0 0.0    0
MSF       0  2 -2  0  0  0 0.0    0
MF        0  2  0  0  0  0 0.0    0
ALP1      1 -4  2  1  0  0 -.25   2
ALP1   -1  0  0 .75 0.0360R1   0 -1  0 .00 0.1906
2Q1     1 -3  0  2  0  0-0.25    5
2Q1    -2 -2  0 .50 0.0063    -1 -1  0 .75 0.0241R1  -1  0  0 .75 0.0607R1
2Q1     0 -2  0 .50 0.0063     0 -1  0 .0  0.1885
SIG1    1 -3  2  0  0  0-0.25    4
SIG1   -1  0  0 .75 0.0095R1   0 -2  0 .50 0.0061     0 -1  0 .0  0.1884
SIG1    2  0  0 .50 0.0087
Q1      1 -2  0  1  0  0-0.25   10
Q1     -2 -3  0 .50 0.0007    -2 -2  0 .50 0.0039    -1 -2  0 .75 0.0010R1
Q1     -1 -1  0 .75 0.0115R1  -1  0  0 .75 0.0292R1   0 -2  0 .50 0.0057
Q1     -1  0  1 .0  0.0008     0 -1  0 .0  0.1884     1  0  0 .75 0.0018R1
Q1      2  0  0 .50 0.0028
RHO1    1 -2  2 -1  0  0-0.25    5
RHO1    0 -2  0 .50 0.0058     0 -1  0 .0  0.1882     1  0  0 .75 0.0131R1
RHO1    2  0  0 .50 0.0576     2  1  0 .0  0.0175
O1      1 -1  0  0  0  0-0.25    8
O1     -1  0  0 .25 0.0003R1   0 -2  0 .50 0.0058     0 -1  0 .0  0.1885
O1      1 -1  0 .25 0.0004R1   1  0  0 .75 0.0029R1   1  1  0 .25 0.0004R1
O1      2  0  0 .50 0.0064     2  1  0 .50 0.0010
TAU1    1 -1  2  0  0  0-0.75    5
TAU1   -2  0  0 .0  0.0446    -1  0  0 .25 0.0426R1   0 -1  0 .50 0.0284
TAU1    0  1  0 .50 0.2170     0  2  0 .50 0.0142
BET1    1  0 -2  1  0  0 -.75    1
BET1    0 -1  0 .00 0.2266
NO1     1  0  0  1  0  0-0.75    9
NO1    -2 -2  0 .50 0.0057    -2 -1  0 .0  0.0665    -2  0  0 .0  0.3596
NO1    -1 -1  0 .75 0.0331R1  -1  0  0 .25 0.2227R1  -1  1  0 .75 0.0290R1
NO1     0 -1  0 .50 0.0290     0  1  0 .0  0.2004     0  2  0 .50 0.0054
CHI1    1  0  2 -1  0  0-0.75    2
CHI1    0 -1  0 .50 0.0282     0  1  0 .0  0.2187
PI1     1  1 -3  0  0  1-0.25    1
PI1     0 -1  0 .50 0.0078
```

```
P1       1  1 -2  0  0  0-0.25   6
P1      0 -2  0 .0  0.0008      0 -1  0 .50 0.0112     0  0  2 .50 0.0004
P1      1  0  0 .75 0.0004R1    2  0  0 .50 0.0015     2  1  0 .50 0.0003
S1       1  1 -1  0  0  1-0.75   2
S1      0  0 -2 .0  0.3534      0  1  0 .50 0.0264
K1       1  1  0  0  0  0-0.75  10
K1     -2 -1  0 .0  0.0002     -1 -1  0 .75 0.0001R1  -1  0  0 .25 0.0007R1
K1     -1  1  0 .75 0.0001R1    0 -2  0 .0  0.0001     0 -1  0 .50 0.0198
K1      0  1  0 .0  0.1356      0  2  0 .50 0.0029     1  0  0 .25 0.0002R1
K1      1  1  0 .25 0.0001R1
PSI1     1  1  1  0  0 -1-0.75   1
PSI1    0  1  0 .0  0.0190
PHI1     1  1  2  0  0  0-0.75   5
PHI1   -2  0  0 .0  0.0344     -2  1  0 .0  0.0106     0  0 -2 .0  0.0132
PHI1    0  1  0 .50 0.0384      0  2  0 .50 0.0185
THE1     1  2 -2  1  0  0 -.75   4
THE1   -2 -1  0 .00  .0300     -1  0  0 .25 0.0141R1   0 -1  0 .50  .0317
THE1    0  1  0 .00  .1993
J1       1  2  0 -1  0  0-0.75  10
J1      0 -1  0 .50 0.0294      0  1  0 .0  0.1980     0  2  0 .50 0.0047
J1      1 -1  0 .75 0.0027R1    1  0  0 .25 0.0816R1   1  1  0 .25 0.0331R1
J1      1  2  0 .25 0.0027R1    2  0  0 .50 0.0152     2  1  0 .50 0.0098
J1      2  2  0 .50 0.0057
OO1      1  3  0  0  0  0-0.75   8
OO1    -2 -1  0 .50 0.0037     -2  0  0 .0  0.1496    -2  1  0 .0  0.0296
OO1    -1  0  0 .25 0.0240R1   -1  1  0 .25 0.0099R1   0  1  0 .0  0.6398
OO1     0  2  0 .0  0.1342      0  3  0 .0  0.0086
UPS1     1  4  0 -1  0  0 -.75   5
UPS1   -2  0  0 .00 0.0611      0  1  0 .00 0.6399     0  2  0 .00 0.1318
UPS1    1  0  0 .25 0.0289R1    1  1  0 .25 0.0257R1
OQ2      2 -3  0  3  0  0 0.0    2
OQ2    -1  0  0 .25 0.1042R2    0 -1  0 .50 0.0386
EPS2     2 -3  2  1  0  0 0.0    3
EPS2   -1 -1  0 .25 0.0075R2   -1  0  0 .25 0.0402R2   0 -1  0 .50 0.0373
2N2      2 -2  0  2  0  0 0.0    4
2N2    -2 -2  0 .50 0.0061     -1 -1  0 .25 0.0117R2  -1  0  0 .25 0.0678R2
2N2     0 -1  0 .50 0.0374
MU2      2 -2  2  0  0  0 0.0    3
MU2    -1 -1  0 .25 0.0018R2   -1  0  0 .25 0.0104R2   0 -1  0 .50 0.0375
N2       2 -1  0  1  0  0 0.0    4
```

```
N2     -2 -2  0 .50 0.0039    -1  0  1 .00 0.0008     0 -2  0 .00 0.0005
N2      0 -1  0 .50 0.0373
NU2      2 -1  2 -1  0  0 0.0    4
NU2     0 -1  0 .50 0.0373     1  0  0 .75 0.0042R2   2  0  0 .0  0.0042
NU2     2  1  0 .50 0.0036
GAM2     2  0 -2  2  0  0 -.50   3
GAM2   -2 -2  0 .00 0.1429    -1  0  0 .25 0.0293R2   0 -1  0 .50 0.0330
H1       2  0 -1  0  0  1-0.50   2
H1      0 -1  0 .50 0.0224     1  0 -1 .50 0.0447
M2       2  0  0  0  0  0 0.0    9
M2     -1 -1  0 .75 0.0001R2  -1  0  0 .75 0.0004R2   0 -2  0 .0  0.0005
M2      0 -1  0 .50 0.0373     1 -1  0 .25 0.0001R2   1  0  0 .75 0.0009R2
M2      1  1  0 .75 0.0002R2   2  0  0 .0  0.0006     2  1  0 .0  0.0002
H2       2  0  1  0  0 -1 0.0    1
H2      0 -1  0 .50 0.0217
LDA2     2  1 -2  1  0  0-0.50   1
LDA2    0 -1  0 .50 0.0448
L2       2  1  0 -1  0  0-0.50   5
L2      0 -1  0 .50 0.0366     2 -1  0 .00 0.0047     2  0  0 .50 0.2505
L2      2  1  0 .50 0.1102     2  2  0 .50 0.0156
T2       2  2 -3  0  0  1 0.0    0
S2       2  2 -2  0  0  0 0.0    3
S2      0 -1  0 .0  0.0022     1  0  0 .75 0.0001R2   2  0  0 .0  0.0001
R2       2  2 -1  0  0 -1-0.50   2
R2      0  0  2 .50 0.2535     0  1  2 .0  0.0141
K2       2  2  0  0  0  0 0.0    5
K2     -1  0  0 .75 0.0024R2  -1  1  0 .75 0.0004R2   0 -1  0 .50 0.0128
K2      0  1  0 .0  0.2980     0  2  0 .0  0.0324
ETA2     2  3  0 -1  0  0 0.0    7
ETA2    0 -1  0 .50 0.0187     0  1  0 .0  0.4355     0  2  0 .0  0.0467
ETA2    1  0  0 .75 0.0747R2   1  1  0 .75 0.0482R2   1  2  0 .75 0.0093R2
ETA2    2  0  0 .50 0.0078
M3       3  0  0  0  0  0 -.50   1
M3      0 -1  0 .50  .0564

2PO1  2   2.0 P1         -1.0 O1
SO1   2   1.0 S2         -1.0 O1
ST36  3   2.0 M2          1.0 N2        -2.0 S2
2NS2  2   2.0 N2         -1.0 S2
ST37  2   3.0 M2         -2.0 S2
```

ST1	3	2.0 N2	1.0 K2	-2.0 S2	
ST2	4	1.0 M2	1.0 N2	1.0 K2	-2.0 S2
ST3	3	2.0 M2	1.0 S2	-2.0 K2	
O2	1	2.0 O1			
ST4	3	2.0 K2	1.0 N2	-2.0 S2	
SNK2	3	1.0 S2	1.0 N2	-1.0 K2	
OP2	2	1.0 O1	1.0 P1		
MKS2	3	1.0 M2	1.0 K2	-1.0 S2	
ST5	3	1.0 M2	2.0 K2	-2.0 S2	
ST6	4	2.0 S2	1.0 N2	-1.0 M2	-1.0 K2
2SK2	2	2.0 S2	-1.0 K2		
MSN2	3	1.0 M2	1.0 S2	-1.0 N2	
ST7	4	2.0 K2	1.0 M2	-1.0 S2	-1.0 N2
2SM2	2	2.0 S2	-1.0 M2		
ST38	3	2.0 M2	1.0 S2	-2.0 N2	
SKM2	3	1.0 S2	1.0 K2	-1.0 M2	
2SN2	2	2.0 S2	-1.0 N2		
NO3	2	1.0 N2	1.0 O1		
MO3	2	1.0 M2	1.0 O1		
NK3	2	1.0 N2	1.0 K1		
SO3	2	1.0 S2	1.0 O1		
MK3	2	1.0 M2	1.0 K1		
SP3	2	1.0 S2	1.0 P1		
SK3	2	1.0 S2	1.0 K1		
ST8	3	2.0 M2	1.0 N2	-1.0 S2	
N4	1	2.0 N2			
3MS4	2	3.0 M2	-1.0 S2		
ST39	4	1.0 M2	1.0 S2	1.0 N2	-1.0 K2
MN4	2	1.0 M2	1.0 N2		
ST40	3	2.0 M2	1.0 S2	-1.0 K2	
ST9	4	1.0 M2	1.0 N2	1.0 K2	-1.0 S2
M4	1	2.0 M2			
ST10	3	2.0 M2	1.0 K2	-1.0 S2	
SN4	2	1.0 S2	1.0 N2		
KN4	2	1.0 K2	1.0 N2		
MS4	2	1.0 M2	1.0 S2		
MK4	2	1.0 M2	1.0 K2		
SL4	2	1.0 S2	1.0 L2		
S4	1	2.0 S2			
SK4	2	1.0 S2	1.0 K2		

MNO5	3	1.0 M2	1.0 N2	1.0 O1	
2MO5	2	2.0 M2	1.0 O1		
3MP5	2	3.0 M2	-1.0 P1		
MNK5	3	1.0 M2	1.0 N2	1.0 K1	
2MP5	2	2.0 M2	1.0 P1		
2MK5	2	2.0 M2	1.0 K1		
MSK5	3	1.0 M2	1.0 S2	1.0 K1	
3KM5	3	1.0 K2	1.0 K1	1.0 M2	
2SK5	2	2.0 S2	1.0 K1		
ST11	3	3.0 N2	1.0 K2	-1.0 S2	
2NM6	2	2.0 N2	1.0 M2		
ST12	4	2.0 N2	1.0 M2	1.0 K2	-1.0 S2
ST41	3	3.0 M2	1.0 S2	-1.0 K2	
2MN6	2	2.0 M2	1.0 N2		
ST13	4	2.0 M2	1.0 N2	1.0 K2	-1.0 S2
M6	1	3.0 M2			
MSN6	3	1.0 M2	1.0 S2	1.0 N2	
MKN6	3	1.0 M2	1.0 K2	1.0 N2	
2MS6	2	2.0 M2	1.0 S2		
2MK6	2	2.0 M2	1.0 K2		
NSK6	3	1.0 N2	1.0 S2	1.0 K2	
2SM6	2	2.0 S2	1.0 M2		
MSK6	3	1.0 M2	1.0 S2	1.0 K2	
ST42	3	2.0 M2	2.0 S2	-1.0 K2	
S6	1	3.0 S2			
ST14	3	2.0 M2	1.0 N2	1.0 O1	
ST15	3	2.0 N2	1.0 M2	1.0 K1	
M7	1	3.5 M2			
ST16	3	2.0 M2	1.0 S2	1.0 O1	
3MK7	2	3.0 M2	1.0 K1		
ST17	4	1.0 M2	1.0 S2	1.0 K2	1.0 O1
ST18	2	2.0 M2	2.0 N2		
3MN8	2	3.0 M2	1.0 N2		
ST19	4	3.0 M2	1.0 N2	1.0 K2	-1.0 S2
M8	1	4.0 M2			
ST20	3	2.0 M2	1.0 S2	1.0 N2	
ST21	3	2.0 M2	1.0 N2	1.0 K2	
3MS8	2	3.0 M2	1.0 S2		
3MK8	2	3.0 M2	1.0 K2		
ST22	4	1.0 M2	1.0 S2	1.0 N2	1.0 K2

ST23	2	2.0 M2	2.0 S2		
ST24	3	2.0 M2	1.0 S2	1.0 K2	
ST25	3	2.0 M2	2.0 N2	1.0 K1	
ST26	3	3.0 M2	1.0 N2	1.0 K1	
4MK9	2	4.0 M2	1.0 K1		
ST27	3	3.0 M2	1.0 S2	1.0 K1	
ST28	2	4.0 M2	1.0 N2		
M10	1	5.0 M2			
ST29	3	3.0 M2	1.0 N2	1.0 S2	
ST30	2	4.0 M2	1.0 S2		
ST31	4	2.0 M2	1.0 N2	1.0 S2	1.0 K2
ST32	2	3.0 M2	2.0 S2		
ST33	3	4.0 M2	1.0 S2	1.0 K1	
M12	1	6.0 M2			
ST34	2	5.0 M2	1.0 S2		
ST35	4	3.0 M2	1.0 N2	1.0 K2	1.0 S2

APPENDIX 2

The following sample input for file reference numbers 4, 10, and 11 will produce an analysis of Race Rocks, B.C. current data for the period of 1400 PST February 8, 1972 to 2400 PST March 3, 1972 inclusive. Constituents P1 and K2 will be inferred, shallow water constituent M10 is specifically designated for analysis inclusion, a scaling compensation will be made for the application of moving average filters to the original 10 minute data, and hourly component values based on the analysis results will be produced on file reference numbers 12 and 13. Note that missing hourly observations are denoted by 99999. Final results as given by the line printer are shown in Appendix 3.

i) File reference number 4 input data:

```
1.00 0.010          0     1     3
 10.00          6     6     7
 K1      0.0417807462  P1      0.0415525871  0.311807  0.197553     -4.5       -0.2
 S2      0.0833333333  K2      0.0835614924  0.191983  0.212745    -14.8       27.2

     M10        M8

 14080272  24150372
    7077 RACE ROCKS SMOOTH&PAL PST 481413912
```

ii) File reference number 10 input data (hourly north/south current components):

```
1  7077       8 272999999999999999999999999999999999999999999999999999999999999
2  7077       8 27299999  166  262  141  -20 -176  -26   28  128  288  133 -144
1  7077       9 272 -108  -14   60   38  -95  -84   41   63   91   84   30   14
2  7077       9 272   23  110  165   95   25 -107 -143   14  -39   -1  -21 -141
1  7077      10 272 -188 -148   50  124   69  -82 -196 -187  -85  -24   19   17
2  7077      10 272  -84  -95    0   72   48  -56 -115  -74  -45 -159  -73 -116
1  7077      11 272 -134  -27 -125 -114  -12  -18 -127 -131 -169 -154  -49 -110
2  7077      11 272 -230 -345 -223   26  166  133   83   24   92   70  -49  -58
1  7077      12 272 -151 -214 -341 -246  -12   67 -116 -258 -367 -368 -226  -68
2  7077      12 272  -49 -100 -125 -273 -140   82   66   59  -99  -48   88   66
1  7077      13 272 -124 -294 -303 -358 -206    1 -168 -316 -360 -417 -309 -138
2  7077      13 272   57   69  149  -41 -277 -101  178  272  177  -18   62  118
1  7077      14 272   63 -109 -424 -514 -373 -174  -72 -380 -206   76  -78 -230
2  7077      14 272 -187  135  270  328  122 -285   11  146  104  116  -30   48
1  7077      15 272  139  145   30 -226 -405 -237   47   48   -1   52  -42   17
2  7077      15 272  -25  -84  136  265  339  254   -8   -3   15  124   76   67
1  7077      16 272  258  135 -102 -242 -138  181  305  188   84  103  195  193
2  7077      16 272  100   38  202  288   97  164  228  106  250  310  231  266
1  7077      17 272  144   98  133   38  -45   24  300  132    3   59  168  154
2  7077      17 272   85  114  164  131  -18 -116   -5   95  -20  -88  -36   41
1  7077      18 272  126  117   69   37 -156 -350 -285  -50  100  -32   54  116
2  7077      18 272  112   87  131  153   15   55   19    3   -7  -52 -282 -345
1  7077      19 272 -171  162  159   13 -138 -212 -104   -4   87    9   64  114
2  7077      19 272  211   92    0  107  102   60  -15 -265 -179  -68  -45  -47
1  7077      20 272  -22   63  124   81  -69 -136 -128  -84   39   16   70   68
2  7077      20 272   35  184  119   65  156  207   21 -363 -317  -44   43  -58
1  7077      21 272  -91  -48   -4   70  -41 -151 -133  -22    2   16  -26   18
2  7077      21 272  -15    6  125   86   72   55   61  -16 -265 -258    1   36
1  7077      22 272   47   94   89   24   98  126   60   -7   30   91  100   36
2  7077      22 272  -36   57  121  119   31   24   33   92   93 -183  -94  228
1  7077      23 272  327  253  231  150  129  185  180   70  -33  -30   14   80
2  7077      23 272   20  -38  -20  -11  -35   10   52   60  108  112 -131 -320
1  7077      24 272 -151   32   69  156   24 -122 -149 -167  -70   41   45  -31
2  7077      24 272  -74 -150 -120  -54    6  -55  -77  109   73   13  194   32
```

1	7077	25	272	-195	-253	-168	17	120	-25	-124	-377	-459	-246	-115	-58
2	7077	25	272	-81	-144	-216	-153	-90	18	-30	-78	18	4	32	182
1	7077	26	272	-2	-322	-272	135	255	110	-198	-553	-295	-370	-607	-532
2	7077	26	272	-422	-399	-282	-207	-135	-101	-32	7	-179	-107	40	18
1	7077	27	272	-32	-171	-371	-509	-343	-68	-139	-450	-332	-107	-96	-129
2	7077	27	272	-369	-474	-470	-332	-244	-136	-57	99	184	54	102	147
1	7077	28	272	22	-130	-254	-367	-260	-79	11	-189	-289	-112	-32	35
2	7077	28	272	93	180	233	157	17	-63	-207	-105	66	163	91	76
1	7077	29	272	15	-161	-226	-275	-186	47	-39	-183	-212	-131	-22	-34
2	7077	29	272	18	68	48	66	-4	140	75	42	94	146	173	74
1	7077	1	372	-11	22	-125	-292	-25	236	126	46	104	223	255	202
2	7077	1	372	145	146	-103	-269	-245	81	178	-27	-233	-36	167	78
1	7077	2	372	-11	45	46	-142	-215	-168	30	39	-63	-12	24	29
2	7077	2	372	76	187	114	32	20	-51	68	104	37	-51	-95	26
1	7077	3	372	167	191	190	67	-39	-29	68	96	-69	14	157	113
2	7077	3	372	46	174	46	52	92	27	-6	-5	29	40	-34	-40
1	7077	4	372	36	90	145	-4	-154	-137	-19	27	-50	-96	37	199
2	7077	4	372	203	219	209	71	74	20	-149	-194	-113	62	88	-11
1	7077	5	372	-24	-16	-91	-187	-182	-128	-42	44	96	59	37	143
2	7077	5	372	150	33	3	129	15	25	-69	-187	-198	-2	142	-17
1	7077	6	372	-253	-204	-149	-154	-154	-115	-40	92	147	28	-132	-62
2	7077	6	372	99999	99999	99999	99999	99999	10	92	10	-58	-1	62	64
1	7077	7	372	-1	-133	-213	-151	-86	-47	-1	-22	-7	-3	-8	32
2	7077	7	372	128	103	14	-4	25	-89	14	90	-18	-53	-14	125
1	7077	8	372	206	50	7	-57	-73	-25	-1	38	73	65	-27	-74
2	7077	8	372	-38	65	-37	-143	-126	-100	-115	-47	-36	12	38	8
1	7077	9	372	-30	46	0	-110	-63	-44	-2	43	17	39	32	-18
2	7077	9	372	-87	-118	108	134	-40	-45	-16	-56	26	34	13	10
1	7077	10	372	-89	-102	-37	61	-80	-265	-213	-127	-86	-36	-10	-121
2	7077	10	372	-182	-171	-67	71	27	-160	-138	-47	-46	28	23	-129
1	7077	11	372	-334	-330	-163	-107	-232	-357	-306	-329	-449	-515	-513	-443
2	7077	11	372	-307	-239	-282	-155	59	-42	-245	-242	-146	-125	34	47
1	7077	12	372	-53	-240	-246	-118	-60	-139	-227	-326	-428	-509	-627	-516
2	7077	12	372	-310	-178	-325	-519	-259	-21	-29	-29	-89	-57	-28	128
1	7077	13	372	148	-131	-320	-235	-121	-160	-287	-358	-479	-283	-197	-172
2	7077	13	372	31	159	142	167	-57	-248	-51	100	23	-111	-46	82
1	7077	14	372	180	39	-105	-76	13	-5	-208	-407	-255	-237	-76	104
2	7077	14	372	176	192	96	45	7	-54	-196	-170	-25	-55	-48	52
1	7077	15	372	76	139	159	62	-77	-68	-211	-519	-308	-75	-7	145
2	7077	15	372	77	140	253	240	-1	34	67	74	105	174	221	240

iii) File reference number 11 input data (hourly east/west current components):

```
1  7077          8 272999999999999999999999999999999999999999999999999
2  7077          8 27299999 -755 -802 -687 -688 -551 -221   41  301  557  684  633
1  7077          9 272  534  363  203  163   46  -90  -66  -30  -25  -20 -119 -326
2  7077          9 272 -553 -716 -771 -739 -503 -343 -354 -124  135  375  672  813
1  7077         10 272  713  586  379  187  109    4  -61 -178 -234 -278 -350 -519
2  7077         10 272 -693 -767 -738 -863 -961 -882 -705 -422  -39  290  620  845
1  7077         11 272  882  839  518  199   12 -109 -281 -590 -572 -485 -449 -437
2  7077         11 272 -626 -802 -851 -885-1140-1202-1059 -800 -355   88  471  856
1  7077         12 272 1044  887  471   40 -208 -228 -345 -578 -609 -523 -343 -176
2  7077         12 272 -220 -553 -814 -955-1162-1447-1545-1210 -640 -162  354 1092
1  7077         13 272 1454 1338 1020  413 -114 -316 -462 -725 -803 -608 -443 -429
2  7077         13 272 -378 -401 -535 -721 -866-1214-1455-1363-1080 -514   97  579
1  7077         14 272 1122 1542 1248  795  232 -216 -458 -773 -699 -328  -61  -82
2  7077         14 272  -45   41   71 -112 -525 -893-1315-1494-1378 -845 -263  282
1  7077         15 272  820 1282 1525 1294  658  -89 -530 -574 -550 -411 -143  131
2  7077         15 272  452  215   41  -73 -347 -879-1108-1322-1434-1115 -487  180
1  7077         16 272  706 1093 1372 1222  865  376  -48 -401 -583 -600 -465 -101
2  7077         16 272  511  639  617  554  400    9 -320 -732-1120-1230 -919 -228
1  7077         17 272  652 1076 1321 1581 1329  861  317 -156 -517 -636 -638 -397
2  7077         17 272   -7  484  565  658  679  369  -27 -407 -719 -915 -902 -752
1  7077         18 272 -318  319  851 1159 1072  743  370 -158 -653-1108-1294-1121
2  7077         18 272 -861 -460   29  413  710  706  447   97 -202 -518 -766 -737
1  7077         19 272 -539 -124  401  826  859  686  312 -129 -621-1043-1300-1328
2  7077         19 272-1178 -771 -264  196  508  728  721  578  206 -161 -393 -478
1  7077         20 272 -429 -203  184  616  804  725  434   59 -307 -714-1203-1625
2  7077         20 272-1023-1211 -687 -132  220  486  845  897  589  522  428  270
1  7077         21 272  152  132  208  403  592  619  489  320  126 -319 -847-1225
2  7077         21 272-1425-1361-1082 -616   32  471  537  825  950  693  631  597
1  7077         22 272  323   53  -45  -12  111  236  360  336  163  -36 -299 -829
2  7077         22 272-1223-1371-1299 -885 -385  268  465  466  838  990  735  671
1  7077         23 272  564  364   80   -2  -44  -23  110  249  283  161  -88 -404
2  7077         23 272 -636 -812-1102-1227-1073 -528  155  274  589  992 1142 1067
1  7077         24 272  837  605  367   85  -79 -219 -310 -195   38  101  -29 -156
2  7077         24 272 -347 -730-1031-1213-1328-1166 -744  -24  223  440  880 1249
```

1	7077	25	272	1232	895	409	115	-68	-194	-371	-448	-279	199	430	314
2	7077	25	272	9	-333	-792	-1095	-1264	-1341	-1162	-638	-82	271	568	965
1	7077	26	272	1334	1129	699	453	104	-267	-591	-564	-484	-248	-13	306
2	7077	26	272	357	66	-310	-741	-1098	-1260	-1301	-1120	-725	-183	271	627
1	7077	27	272	1130	1355	960	273	-214	-468	-625	-830	-619	-236	-11	66
2	7077	27	272	254	249	50	-307	-745	-1066	-1346	-1446	-1188	-770	-148	311
1	7077	28	272	796	1182	1135	731	173	-243	-542	-792	-823	-578	-344	-60
2	7077	28	272	0	135	166	-24	-198	-561	-1004	-1235	-1143	-672	-23	463
1	7077	29	272	699	986	1150	1065	567	247	-79	-365	-547	-515	-233	172
2	7077	29	272	296	404	370	235	31	-39	-300	-853	-950	-623	-43	641
1	7077	1	372	965	1128	1293	1219	905	533	173	-243	-504	-388	-136	309
2	7077	1	372	628	744	912	794	362	-62	-309	-601	-881	-891	-502	115
1	7077	2	372	394	542	904	890	536	141	-261	-550	-922	-1170	-1063	-831
2	7077	2	372	-302	217	341	564	535	293	-72	-336	-582	-782	-728	-444
1	7077	3	372	-64	257	541	698	550	217	-138	-495	-873	-1131	-1241	-1048
2	7077	3	372	-537	140	363	525	699	597	381	140	-59	-313	-586	-572
1	7077	4	372	-271	13	373	719	658	432	140	-201	-583	-1008	-1195	-1060
2	7077	4	372	-705	-194	233	331	610	738	637	357	80	-113	-188	-203
1	7077	5	372	-52	191	454	605	505	317	49	-302	-653	-896	-1140	-1286
2	7077	5	372	-1049	-660	-228	103	206	458	554	497	261	8	-56	-4
1	7077	6	372	-25	-70	11	197	267	144	-107	-424	-717	-1068	-1226	-1311
2	7077	6	372	99999	99999	99999	99999	99999	178	426	474	308	200	237	134
1	7077	7	372	76	70	138	160	273	385	314	89	-170	-419	-679	-891
2	7077	7	372	-1022	-965	-700	-335	-3	180	373	628	758	674	369	151
1	7077	8	372	77	37	23	61	33	-24	-86	-156	-336	-615	-736	-755
2	7077	8	372	-830	-955	-905	-662	-424	-134	108	316	473	506	494	405
1	7077	9	372	226	-5	-95	-185	-253	-298	-342	-357	-348	-403	-479	-621
2	7077	9	372	-748	-757	-794	-875	-740	-484	-157	8	187	400	524	537
1	7077	10	372	418	156	-129	-270	-385	-528	-485	-450	-374	-298	-346	-487
2	7077	10	372	-608	-703	-725	-810	-937	-828	-539	-181	87	405	740	824
1	7077	11	372	657	426	173	-79	-263	-512	-622	-495	-456	-467	-442	-368
2	7077	11	372	-401	-493	-621	-775	-1021	-1184	-941	-477	-126	164	511	754
1	7077	12	372	896	713	203	-107	-301	-474	-577	-664	-577	-394	-405	-405
2	7077	12	372	-282	-184	-376	-708	-981	-1276	-1235	-927	-443	-68	242	578
1	7077	13	372	949	1116	789	140	-233	-463	-769	-899	-939	-706	-403	-214
2	7077	13	372	-98	-47	-59	-325	-885	-1185	-1437	-1371	-866	-396	-50	327
1	7077	14	372	767	1107	932	469	30	-357	-775	-979	-974	-629	-310	69
2	7077	14	372	276	416	455	308	-69	-702	-1305	-1310	-1170	-748	-94	223
1	7077	15	372	510	738	890	871	399	-109	-635	-1101	-1205	-1163	-715	-172
2	7077	15	372	132	300	375	347	179	-212	-588	-881	-1119	-972	-551	5

APPENDIX 3

Final analysis results arising from the input data of Appendix 2 and the Standard Constituent Data package of Appendix 1.

FINAL ANALYSIS RESULTS IN CURRENT ELLIPSE FORM

FOR STATION 7077, RACE ROCKS SMOOTH&PAD ,AT THE LOCATION 48 14, 139 12
OVER THE PERIOD OF 14HR 8/ 2/72 TO 24HR 15/ 3/72

NODAL MODULATION AND INFERENCE CORRECTIONS HAVE BEEN MADE
AMPLITUDES HAVE BEEN SCALED TO COMPENSATE FOR THE PRIOR APPLICATION OF MOVING AVERAGE FILTERS
GREENWICH PHASES ARE FOR TIME ZONE PST

	NAME	SPEED	MAJOR	MINOR	INC	G	G+	G-	
1	Z0	.00000000	.945	.000	13.5	180.0	166.5	193.5	
2	MM	.00151215	.787	-.072	2.0	85.7	83.7	87.7	
3	MSF	.00282193	1.087	-.008	47.2	106.8	59.6	154.0	
4	ALP1	.03439657	.113	-.037	162.3	332.0	169.8	134.3	
5	2Q1	.03570635	.442	-.052	5.1	121.5	116.5	126.6	
6	Q1	.03721850	.461	-.065	175.1	236.8	61.8	51.9	
7	O1	.03873065	2.410	-.253	177.5	250.2	72.8	67.7	
8	NO1	.04026859	.494	-.112	6.8	92.2	85.5	99.0	
9	P1	.04155259	1.272	.232	178.7	270.5	91.8	89.3	INF FR K1
10	K1	.04178075	5.043	-.221	.9	88.2	87.3	89.1	
11	J1	.04329290	.142	.103	22.9	123.9	101.0	146.8	
12	OO1	.04483084	.455	.125	125.7	334.4	208.8	100.1	
13	UPS1	.04634299	.180	.070	159.3	27.1	227.8	186.4	
14	EPS2	.07617732	.198	-.028	41.4	136.8	95.3	178.2	
15	MU2	.07768947	.409	.048	8.1	293.2	285.1	301.2	
16	N2	.07899925	1.369	-.035	173.8	225.2	51.4	39.0	
17	M2	.08051140	6.980	-.295	178.3	249.2	70.9	67.6	

18	L2	.08202355	.390	-.240	174.1	107.1	293.0	281.2	
19	S2	.08333333	2.278	-.148	5.9	90.6	84.7	96.4	
20	K2	.08356149	.462	-.054	164.9	264.4	99.5	69.2	INF FR S2
21	ETA2	.08507364	.157	-.024	76.9	62.8	345.9	139.7	
22	MO3	.11924206	.343	-.135	21.4	344.9	323.4	6.3	
23	M3	.12076710	.265	.139	155.2	99.3	304.2	254.5	
24	MK3	.12229215	.346	-.096	115.0	18.4	263.4	133.4	
25	SK3	.12511408	.219	-.179	169.1	321.1	152.0	130.2	
26	MN4	.15951065	.289	-.078	49.4	258.5	209.1	307.9	
27	M4	.16102280	.383	.182	141.6	114.6	333.1	256.2	
28	SN4	.16233258	.084	-.024	34.1	197.6	163.5	231.7	
29	MS4	.16384473	.366	-.063	74.0	40.2	326.2	114.2	
30	S4	.16666667	.089	.015	91.1	18.1	287.0	109.2	
31	2MK5	.20280355	.423	-.072	143.2	129.6	346.4	272.9	
32	2SK5	.20844741	.154	.006	61.8	159.3	97.4	221.1	
33	2MN6	.24002205	.169	.027	117.2	85.6	328.4	202.8	
34	M6	.24153420	.350	-.048	174.1	111.3	297.2	285.4	
35	2MS6	.24435613	.238	-.194	95.2	202.8	107.6	298.0	
36	2SM6	.24717807	.156	-.120	97.2	184.9	87.6	282.1	
37	3MK7	.28331495	.145	.041	25.5	265.7	240.2	291.3	
38	M8	.32204560	.184	-.074	18.9	321.7	302.9	340.6	
39	M10	.40255700	.214	.087	45.7	322.7	277.0	8.4	

AFTER INFERENCE, X RMS(RESID ER)= 1.57686, AND Y RMS(RESID ER)= 1.29416

APPENDIX 4

The following sample input for file reference number 8 will synthesize three sets of currents at Race Rocks, B.C.:

i) the times, magnitudes, and directions of all maximum and minimum values for the period of 0100 PST July 1, 1976 to 2400 PST July 31, 1976;

ii) the magnitudes and directions of hourly currents for the period of 0100 PST July 1, 1976 to 2400 PST July 5, 1976;

iii) the north/south and east/west hourly current components for the period of 0100 PST July 1, 1976 to 2400 PST July 31, 1976.

Note that the ellipse parameter and phase input values of the constituents to be used in the prediction were selected from the results listed in Appendix 3. The number of the constituent, its frequency, and its g^+ and g^- values are not required.

The output results for file reference numbers 10, 11 and 12 are listed in Appendix 5.

```
  .7428797055  .7771900329  .5187051308  .3631582592  .7847990160  000GMT 1/1/76
13.3594019864  .9993368945  .1129517942  .0536893056  .0000477414  INCR./365DAYS
     Z0        0   0   0   0   0   0 0.0      0
     SA        0   0   1   0   0  -1 0.0      0
     SSA       0   0   2   0   0   0 0.0      0
     MSM       0   1  -2   1   0   0  .00     0
     MM        0   1   0  -1   0   0 0.0      0
     MSF       0   2  -2   0   0   0 0.0      0
     MF        0   2   0   0   0   0 0.0      0
     ALP1      1  -4   2   1   0   0 -.25     2
     ALP1   -1   0   0 .75 0.0360R1    0 -1   0 .00 0.1906
     2Q1       1  -3   0   2   0   0-0.25     5
     2Q1    -2  -2   0 .50 0.0063     -1 -1   0 .75 0.0241R1  -1   0   0 .75 0.0607R1
     2Q1     0  -2   0 .50 0.0063      0 -1   0 .0  0.1885
```

```
SIG1     1 -3  2  0  0  0-0.25   4
SIG1   -1  0  0 .75 0.0095R1   0 -2  0 .50 0.0061      0 -1  0 .0  0.1884
SIG1    2  0  0 .50 0.0087
G1       1 -2  0  1  0  0-0.25  10
G1     -2 -3  0 .50 0.0007    -2 -2  0 .50 0.0039    -1 -2  0 .75 0.0010R1
G1     -1 -1  0 .75 0.0115R1  -1  0  0 .75 0.0292R1   0 -2  0 .50 0.0057
G1     -1  0  1 .0  0.0008     0 -1  0 .0  0.1884     1  0  0 .75 0.0018R1
G1      2  0  0 .50 0.0028
RHO1     1 -2  2 -1  0  0-0.25   5
RHO1    0 -2  0 .50 0.0058     0 -1  0 .0  0.1882     1  0  0 .75 0.0131R1
RHO1    2  0  0 .50 0.0576     2  1  0 .0  0.0175
O1       1 -1  0  0  0  0-0.25   6
O1     -1  0  0 .25 0.0003R1   0 -2  0 .50 0.0058     0 -1  0 .0  0.1885
O1      1 -1  0 .25 0.0004R1   1  0  0 .75 0.0029R1   1  1  0 .25 0.0004R1
O1      2  0  0 .50 0.0064     2  1  0 .50 0.0010
TAU1     1 -1  2  0  0  0-0.75   5
TAU1   -2  0  0 .0  0.0446    -1  0  0 .25 0.0426R1   0 -1  0 .50 0.0284
TAU1    0  1  0 .50 0.2170     0  2  0 .50 0.0142
BET1     1  0 -2  1  0  0 -.75   1
BET1    0 -1  0 .00 0.2266
NO1      1  0  0  1  0  0-0.75   9
NO1    -2 -2  0 .50 0.0057    -2 -1  0 .0  0.0665    -2  0  0 .0  0.3596
NO1    -1 -1  0 .75 0.0331R1  -1  0  0 .25 0.2227R1  -1  1  0 .75 0.0290R1
NO1     0 -1  0 .50 0.0290     0  1  0 .0  0.2004     0  2  0 .50 0.0054
CHI1     1  0  2 -1  0  0-0.75   2
CHI1    0 -1  0 .50 0.0282     0  1  0 .0  0.2187
PI1      1  1 -3  0  0  1-0.25   1
PI1     0 -1  0 .50 0.0078
P1       1  1 -2  0  0  0-0.25   6
P1      0 -2  0 .0  0.0008     0 -1  0 .50 0.0112     0  0  2 .50 0.0004
P1      1  0  0 .75 0.0004R1   2  0  0 .50 0.0015     2  1  0 .50 0.0003
S1       1  1 -1  0  0  1-0.75   2
S1      0  0 -2 .0  0.3534     0  1  0 .50 0.0264
K1       1  1  0  0  0  0-0.75  10
K1     -2 -1  0 .0  0.0002    -1 -1  0 .75 0.0001R1  -1  0  0 .25 0.0007R1
K1     -1  1  0 .75 0.0001R1   0 -2  0 .0  0.0001     0 -1  0 .50 0.0198
K1      0  1  0 .0  0.1356     0  2  0 .50 0.0029     1  0  0 .25 0.0002R1
K1      1  1  0 .25 0.0001R1
PSI1     1  1  1  0  0 -1-0.75   1
PSI1    0  1  0 .0  0.0190
```

```
PHI1     1  1  2  0  0  0-0.75   5
PHI1    -2  0  0 .0  0.0344    -2  1  0 .0  0.0106     0  0 -2 .0  0.0132
PHI1     0  1  0 .50 0.0384     0  2  0 .50 0.0185
THE1     1  2 -2  1  0  0 -.75   4
THE1    -2 -1  0 .00  .0300    -1  0  0 .25 0.0141R1   0 -1  0 .50  .0317
THE1     0  1  0 .00  .1993
J1       1  2  0 -1  0  0-0.75  10
J1       0 -1  0 .50 0.0294     0  1  0 .0  0.1980     0  2  0 .50 0.0047
J1       1 -1  0 .75 0.0027R1   1  0  0 .25 0.0816R1   1  1  0 .25 0.0331R1
J1       1  2  0 .25 0.0027R1   2  0  0 .50 0.0152     2  1  0 .50 0.0098
J1       2  2  0 .50 0.0057
OO1      1  3  0  0  0  0-0.75   8
OO1     -2 -1  0 .50 0.0037    -2  0  0 .0  0.1496    -2  1  0 .0  0.0296
OO1     -1  0  0 .25 0.0240R1  -1  1  0 .25 0.0099R1   0  1  0 .0  0.6398
OO1      0  2  0 .0  0.1342     0  3  0 .0  0.0086
UPS1     1  4  0 -1  0  0 -.75   5
UPS1    -2  0  0 .00 0.0611     0  1  0 .00 0.6399     0  2  0 .00 0.1318
UPS1     1  0  0 .25 0.0289R1   1  1  0 .25 0.0257R1
OQ2      2 -3  0  3  0  0 0.0    2
OQ2     -1  0  0 .25 0.1042R2   0 -1  0 .50 0.0386
EPS2     2 -3  2  1  0  0 0.0    3
EPS2    -1 -1  0 .25 0.0075R2  -1  0  0 .25 0.0402R2   0 -1  0 .50 0.0373
2N2      2 -2  0  2  0  0 0.0    4
2N2     -2 -2  0 .50 0.0061    -1 -1  0 .25 0.0117R2  -1  0  0 .25 0.0678R2
2N2      0 -1  0 .50 0.0374
MU2      2 -2  2  0  0  0 0.0    3
MU2     -1 -1  0 .25 0.0018R2  -1  0  0 .25 0.0104R2   0 -1  0 .50 0.0375
N2       2 -1  0  1  0  0 0.0    4
N2      -2 -2  0 .50 0.0039    -1  0  1 .00 0.0008     0 -2  0 .00 0.0005
N2       0 -1  0 .50 0.0373
NU2      2 -1  2 -1  0  0 0.0    4
NU2      0 -1  0 .50 0.0373     1  0  0 .75 0.0042R2   2  0  0 .0  0.0042
NU2      2  1  0 .50 0.0036
GAM2     2  0 -2  2  0  0 -.50   3
GAM2    -2 -2  0 .00 0.1429    -1  0  0 .25 0.0293R2   0 -1  0 .50 0.0330
H1       2  0 -1  0  0  1-0.50   2
H1       0 -1  0 .50 0.0224     1  0 -1 .50 0.0447
M2       2  0  0  0  0  0 0.0    9
M2      -1 -1  0 .75 0.0001R2  -1  0  0 .75 0.0004R2   0 -2  0 .0  0.0005
M2       0 -1  0 .50 0.0373     1 -1  0 .25 0.0001R2   1  0  0 .75 0.0009R2
```

```
M2       1  1  0 .75 0.0002R2    2  0  0 .0  0.0006      2  1  0 .0  0.0002
M2        2  0  1  0   0 -1 0.0     1
M2       0 -1  0 .50 0.0217
LDA2      2  1 -2  1   0  0-0.50    1
LDA2     0 -1  0 .50 0.0448
L2        2  1  0 -1   0  0-0.50    5
L2       0 -1  0 .50 0.0366      2 -1  0 .00 0.0047      2  0  0 .50 0.2505
L2       2  1  0 .50 0.1102      2  2  0 .50 0.0156
T2        2  2 -3  0   0  1 0.0     0
S2        2  2 -2  0   0  0 0.0     3
S2       0 -1  0 .0  0.0022      1  0  0 .75 0.0001R2    2  0  0 .0  0.0001
R2        2  2 -1  0   0 -1-0.50    2
R2       0  0  2 .50 0.2535      0  1  2 .0  0.0141
K2        2  2  0  0   0  0 0.0     5
K2      -1  0  0 .75 0.0024R2   -1  1  0 .75 0.0004R2    0 -1  0 .50 0.0128
K2       0  1  0 .0  0.2980      0  2  0 .0  0.0324
ETA2      2  3  0 -1   0  0 0.0     7
ETA2     0 -1  0 .50 0.0187      0  1  0 .0  0.4355      0  2  0 .0  0.0467
ETA2     1  0  0 .75 0.0747R2    1  1  0 .75 0.0482R2    1  2  0 .75 0.0093R2
ETA2     2  0  0 .50 0.0078
M3        3  0  0  0   0  0 -.50    1
M3       0 -1  0 .50  .0564

2PO1  2    2.0 P1         -1.0 O1
SO1   2    1.0 S2         -1.0 O1
ST36  3    2.0 M2          1.0 N2          -2.0 S2
2NS2  2    2.0 N2         -1.0 S2
ST37  2    3.0 M2         -2.0 S2
ST1   3    2.0 N2          1.0 K2          -2.0 S2
ST2   4    1.0 M2          1.0 N2           1.0 K2          -2.0 S2
ST3   3    2.0 M2          1.0 S2          -2.0 K2
O2    1    2.0 O1
ST4   3    2.0 K2          1.0 N2          -2.0 S2
SNK2  3    1.0 S2          1.0 N2          -1.0 K2
OP2   2    1.0 O1          1.0 P1
MKS2  3    1.0 M2          1.0 K2          -1.0 S2
ST5   3    1.0 M2          2.0 K2          -2.0 S2
ST6   4    2.0 S2          1.0 N2          -1.0 M2          -1.0 K2
2SK2  2    2.0 S2         -1.0 K2
MSN2  3    1.0 M2          1.0 S2          -1.0 N2
```

ST7	4	2.0 K2	1.0 M2	-1.0 S2	-1.0 N2
2SM2	2	2.0 S2	-1.0 M2		
ST38	3	2.0 M2	1.0 S2	-2.0 N2	
SKM2	3	1.0 S2	1.0 K2	-1.0 M2	
2SN2	2	2.0 S2	-1.0 N2		
NO3	2	1.0 N2	1.0 O1		
MO3	2	1.0 M2	1.0 O1		
NK3	2	1.0 N2	1.0 K1		
SO3	2	1.0 S2	1.0 O1		
MK3	2	1.0 M2	1.0 K1		
SP3	2	1.0 S2	1.0 P1		
SK3	2	1.0 S2	1.0 K1		
ST8	3	2.0 M2	1.0 N2	-1.0 S2	
N4	1	2.0 N2			
3MS4	2	3.0 M2	-1.0 S2		
ST39	4	1.0 M2	1.0 S2	1.0 N2	-1.0 K2
MN4	2	1.0 M2	1.0 N2		
ST40	3	2.0 M2	1.0 S2	-1.0 K2	
ST9	4	1.0 M2	1.0 N2	1.0 K2	-1.0 S2
M4	1	2.0 M2			
ST10	3	2.0 M2	1.0 K2	-1.0 S2	
SN4	2	1.0 S2	1.0 N2		
KN4	2	1.0 K2	1.0 N2		
MS4	2	1.0 M2	1.0 S2		
MK4	2	1.0 M2	1.0 K2		
SL4	2	1.0 S2	1.0 L2		
S4	1	2.0 S2			
SK4	2	1.0 S2	1.0 K2		
MNO5	3	1.0 M2	1.0 N2	1.0 O1	
2MO5	2	2.0 M2	1.0 O1		
3MP5	2	3.0 M2	-1.0 P1		
MNK5	3	1.0 M2	1.0 N2	1.0 K1	
2MP5	2	2.0 M2	1.0 P1		
2MK5	2	2.0 M2	1.0 K1		
MSK5	3	1.0 M2	1.0 S2	1.0 K1	
3KM5	3	1.0 K2	1.0 K1	1.0 M2	
2SK5	2	2.0 S2	1.0 K1		
ST11	3	3.0 N2	1.0 K2	-1.0 S2	
2NM6	2	2.0 N2	1.0 M2		
ST12	4	2.0 N2	1.0 M2	1.0 K2	-1.0 S2

ST41	3	3.0 M2	1.0 S2	-1.0 K2	
2MN6	2	2.0 M2	1.0 N2		
ST13	4	2.0 M2	1.0 N2	1.0 K2	-1.0 S2
M6	1	3.0 M2			
MSN6	3	1.0 M2	1.0 S2	1.0 N2	
MKN6	3	1.0 M2	1.0 K2	1.0 N2	
2MS6	2	2.0 M2	1.0 S2		
2MK6	2	2.0 M2	1.0 K2		
NSK6	3	1.0 N2	1.0 S2	1.0 K2	
2SM6	2	2.0 S2	1.0 M2		
MSK6	3	1.0 M2	1.0 S2	1.0 K2	
ST42	3	2.0 M2	2.0 S2	-1.0 K2	
S6	1	3.0 S2			
ST14	3	2.0 M2	1.0 N2	1.0 O1	
ST15	3	2.0 N2	1.0 M2	1.0 K1	
M7	1	3.5 M2			
ST16	3	2.0 M2	1.0 S2	1.0 O1	
3MK7	2	3.0 M2	1.0 K1		
ST17	4	1.0 M2	1.0 S2	1.0 K2	1.0 O1
ST18	2	2.0 M2	2.0 N2		
3MN8	2	3.0 M2	1.0 N2		
ST19	4	3.0 M2	1.0 N2	1.0 K2	-1.0 S2
M8	1	4.0 M2			
ST20	3	2.0 M2	1.0 S2	1.0 N2	
ST21	3	2.0 M2	1.0 N2	1.0 K2	
3MS8	2	3.0 M2	1.0 S2		
3MK8	2	3.0 M2	1.0 K2		
ST22	4	1.0 M2	1.0 S2	1.0 N2	1.0 K2
ST23	2	2.0 M2	2.0 S2		
ST24	3	2.0 M2	1.0 S2	1.0 K2	
ST25	3	2.0 M2	2.0 N2	1.0 K1	
ST26	3	3.0 M2	1.0 N2	1.0 K1	
4MK9	2	4.0 M2	1.0 K1		
ST27	3	3.0 M2	1.0 S2	1.0 K1	
ST28	2	4.0 M2	1.0 N2		
M10	1	5.0 M2			
ST29	3	3.0 M2	1.0 N2	1.0 S2	
ST30	2	4.0 M2	1.0 S2		
ST31	4	2.0 M2	1.0 N2	1.0 S2	1.0 K2
ST32	2	3.0 M2	2.0 S2		

ST33	3	4.0 M2	1.0 S2	1.0 K1				
M12	1	6.0 M2						
ST34	2	5.0 M2	1.0 S2					
ST35	4	3.0 M2	1.0 N2	1.0 K2	1.0 S2			

7120 RACE ROCKS BC PST 48 14 139 12

1	Z0	.00000000	.945	.000	13.5	180.0	166.5	193.5	
5	2Q1	.03570635	.442	-.052	5.1	121.5	116.5	126.6	
6	Q1	.03721850	.461	-.065	175.1	236.8	61.8	51.9	
7	O1	.03873065	2.410	-.253	177.5	250.2	72.8	67.7	
8	NO1	.04026859	.494	-.112	6.8	92.2	85.5	99.0	
9	P1	.04155259	1.272	.232	178.7	270.5	91.8	89.3	INF FR K1
10	K1	.04178075	5.043	-.221	.9	88.2	87.3	89.1	
11	J1	.04329290	.142	.103	22.9	123.9	101.0	146.8	
12	OO1	.04483084	.455	.125	125.7	334.4	208.8	100.1	
13	UPS1	.04634299	.180	.070	159.3	27.1	227.8	186.4	
16	N2	.07899925	1.369	-.035	173.8	225.2	51.4	39.0	
17	M2	.08051140	6.980	-.295	178.3	249.2	70.9	67.6	
19	S2	.08333333	2.278	-.148	5.9	90.6	84.7	96.4	
20	K2	.08356149	.462	-.054	164.9	264.4	99.5	69.2	INF FR S2
21	ETA2	.08507364	.157	-.024	76.9	62.8	345.9	139.7	

001007076	031007076	EXTR		0.25
001007076	005007076	EQUI		1.0
001007076	031007076	EQUI	COMP	1.0

APPENDIX 5

Tidal currents prediction results arising from the input data of Appendix 4.

i) File reference number 10 output: the hourly current magnitudes for the period of 0100 PST July 1, 1976 to 2400 PST July 5, 1976, followed by the north/south hourly current components for the period of 0100 PST July 1, 1976 to 2400 PST July 31, 1976.

STN	1ST HR	DATE	1	2	3	4	5	6	7	8	DT HRS
7120	1.00	1 776	4.79	1.99	.70	2.21	2.09	.77	3.41	7.22	1.00
7120	9.00	1 776	10.55	12.39	12.08	9.46	4.94	1.02	6.27	10.55	1.00
7120	17.00	1 776	12.74	12.44	9.83	5.61	1.05	3.79	6.73	7.76	1.00
7120	1.00	2 776	6.86	4.52	1.57	1.04	2.45	2.23	.78	3.04	1.00
7120	9.00	2 776	6.46	9.28	10.62	9.95	7.23	2.94	2.21	6.87	1.00
7120	17.00	2 776	10.22	11.51	10.51	7.48	3.19	1.77	5.61	8.06	1.00
7120	1.00	3 776	8.61	7.33	4.74	1.65	1.03	2.56	2.56	1.18	1.00
7120	9.00	3 776	1.91	4.73	7.05	8.06	7.33	4.87	1.15	3.12	1.00
7120	17.00	3 776	6.89	9.34	9.88	8.36	5.10	1.01	3.81	7.44	1.00
7120	1.00	4 776	9.57	9.84	8.32	5.52	2.21	.79	2.75	3.29	1.00
7120	9.00	4 776	2.43	.69	2.22	4.14	5.09	4.63	2.74	.21	1.00
7120	17.00	4 776	3.53	6.41	8.11	8.10	6.27	2.91	1.54	5.79	1.00
7120	1.00	5 776	9.28	11.27	11.39	9.70	6.63	2.92	.64	3.28	1.00
7120	9.00	5 776	4.58	4.42	3.07	1.19	1.14	2.29	2.39	1.27	1.00
7120	17.00	5 776	.82	3.32	5.52	6.72	6.41	4.45	1.10	3.25	1.00

STN	1ST HR	DATE	1	2	3	4	5	6	7	8	DT HRS
7120	1.00	1 776	-.15	-.17	-.30	-.48	-.66	-.77	-.76	-.62	1.00
7120	9.00	1 776	-.35	-.00	.34	.61	.75	.71	.50	.17	1.00

7120	17.00	1	776	-.20	-.55	-.80	-.89	-.83	-.64	-.38	-.14	1.00
7120	1.00	2	776	.03	.07	-.02	-.21	-.44	-.65	-.76	-.74	1.00
7120	9.00	2	776	-.56	-.28	.06	.36	.55	.59	.45	.17	1.00
7120	17.00	2	776	-.20	-.56	-.84	-.96	-.91	-.70	-.38	-.04	1.00
7120	1.00	3	776	.24	.39	.37	.20	-.08	-.39	-.64	-.78	1.00
7120	9.00	3	776	-.75	-.58	-.31	-.01	.23	.35	.31	.10	1.00
7120	17.00	3	776	-.21	-.56	-.85	-1.00	-.97	-.75	-.40	.01	1.00
7120	1.00	4	776	.39	.65	.73	.61	.33	-.05	-.43	-.73	1.00
7120	9.00	4	776	-.88	-.85	-.68	-.41	-.14	.06	.12	.03	1.00
7120	17.00	4	776	-.19	-.49	-.76	-.94	-.95	-.78	-.44	-.01	1.00
7120	1.00	5	776	.42	.76	.93	.89	.65	.25	-.20	-.61	1.00
7120	9.00	5	776	-.91	-1.03	-.97	-.76	-.49	-.23	-.06	-.03	1.00
7120	17.00	5	776	-.13	-.34	-.57	-.76	-.83	-.73	-.48	-.10	1.00
7120	1.00	6	776	.32	.68	.91	.95	.77	.43	-.02	-.48	1.00
7120	9.00	6	776	-.85	-1.07	-1.11	-.98	-.74	-.45	-.21	-.06	1.00
7120	17.00	6	776	-.04	-.15	-.32	-.50	-.61	-.60	-.46	-.20	1.00
7120	1.00	7	776	.12	.44	.67	.76	.67	.42	.05	-.35	1.00
7120	9.00	7	776	-.71	-.97	-1.07	-1.01	-.82	-.56	-.29	-.09	1.00
7120	17.00	7	776	.02	.01	-.08	-.22	-.35	-.42	-.39	-.28	1.00
7120	1.00	8	776	-.09	.11	.29	.39	.37	.24	.01	-.26	1.00
7120	9.00	8	776	-.52	-.72	-.83	-.82	-.70	-.52	-.31	-.12	1.00
7120	17.00	8	776	.01	.06	.04	-.04	-.14	-.24	-.30	-.31	1.00
7120	1.00	9	776	-.27	-.20	-.13	-.07	-.04	-.06	-.13	-.22	1.00
7120	9.00	9	776	-.31	-.39	-.43	-.43	-.39	-.32	-.23	-.14	1.00
7120	17.00	9	776	-.07	-.02	-.01	-.03	-.07	-.14	-.21	-.29	1.00
7120	1.00	10	776	-.37	-.43	-.48	-.49	-.47	-.42	-.34	-.24	1.00
7120	9.00	10	776	-.13	-.04	.03	.07	.06	.01	-.06	-.13	1.00
7120	17.00	10	776	-.19	-.22	-.21	-.19	-.16	-.14	-.17	-.24	1.00
7120	1.00	11	776	-.37	-.52	-.68	-.80	-.84	-.77	-.61	-.35	1.00
7120	9.00	11	776	-.06	.23	.45	.56	.55	.41	.20	-.06	1.00
7120	17.00	11	776	-.29	-.44	-.50	-.46	-.36	-.24	-.16	-.16	1.00
7120	1.00	12	776	-.27	-.46	-.70	-.92	-1.06	-1.05	-.88	-.55	1.00
7120	9.00	12	776	-.13	.32	.69	.92	.95	.79	.47	.07	1.00
7120	17.00	12	776	-.33	-.63	-.78	-.76	-.61	-.39	-.18	-.06	1.00
7120	1.00	13	776	-.09	-.26	-.53	-.84	-1.09	-1.20	-1.10	-.79	1.00
7120	9.00	13	776	-.33	.20	.70	1.04	1.16	1.03	.68	.20	1.00
7120	17.00	13	776	-.31	-.73	-.97	-.99	-.82	-.52	-.19	.06	1.00
7120	1.00	14	776	.15	.05	-.22	-.59	-.94	-1.18	-1.22	-1.02	1.00
7120	9.00	14	776	-.61	-.07	.47	.90	1.11	1.06	.75	.27	1.00
7120	17.00	14	776	-.27	-.75	-1.05	-1.12	-.95	-.61	-.19	.17	1.00

7120	1.00	15	776	.39	.33	.17	-.21	-.64	-1.00	-1.13	-1.14	1.00
7120	9.00	15	776	-.86	-.41	.10	.56	.84	.68	.66	.25	1.00
7120	17.00	15	776	-.26	-.73	-1.05	-1.15	-1.00	-.64	-.18	.26	1.00
7120	1.00	16	776	.57	.67	.53	.20	-.25	-.69	-1.00	-1.11	1.00
7120	9.00	16	776	-1.00	-.69	-.27	.14	.44	.55	.43	.13	1.00
7120	17.00	16	776	-.29	-.70	-1.00	-1.10	-.97	-.64	-.18	.28	1.00
7120	1.00	17	776	.65	.83	.79	.52	.12	-.33	-.71	-.95	1.00
7120	9.00	17	776	-.98	-.83	-.55	-.22	.05	.18	.14	-.06	1.00
7120	17.00	17	776	-.37	-.69	-.92	-1.01	-.90	-.61	-.19	.25	1.00
7120	1.00	18	776	.63	.85	.88	.70	.38	-.03	-.41	-.70	1.00
7120	9.00	18	776	-.84	-.81	-.67	-.46	-.26	-.15	-.15	-.26	1.00
7120	17.00	18	776	-.46	-.63	-.84	-.89	-.78	-.54	-.19	.20	1.00
7120	1.00	19	776	.53	.76	.82	.72	.46	.16	-.18	-.46	1.00
7120	9.00	19	776	-.64	-.70	-.66	-.56	-.45	-.38	-.37	-.43	1.00
7120	17.00	19	776	-.55	-.67	-.75	-.75	-.64	-.43	-.15	.15	1.00
7120	1.00	20	776	.42	.60	.67	.61	.44	.20	-.05	-.29	1.00
7120	9.00	20	776	-.46	-.55	-.58	-.56	-.53	-.51	-.52	-.56	1.00
7120	17.00	20	776	-.61	-.66	-.67	-.61	-.49	-.31	-.08	.15	1.00
7120	1.00	21	776	.34	.46	.50	.45	.33	.16	-.02	-.20	1.00
7120	9.00	21	776	-.33	-.43	-.48	-.52	-.54	-.57	-.60	-.64	1.00
7120	17.00	21	776	-.67	-.66	-.62	-.52	-.37	-.20	-.01	.16	1.00
7120	1.00	22	776	.29	.36	.36	.31	.21	.09	-.04	-.15	1.00
7120	9.00	22	776	-.24	-.32	-.38	-.44	-.51	-.58	-.64	-.69	1.00
7120	17.00	22	776	-.71	-.69	-.61	-.49	-.33	-.15	.02	.15	1.00
7120	1.00	23	776	.24	.28	.26	.21	.13	.05	-.03	-.09	1.00
7120	9.00	23	776	-.14	-.19	-.25	-.33	-.42	-.53	-.63	-.71	1.00
7120	17.00	23	776	-.75	-.73	-.66	-.53	-.37	-.20	-.05	.08	1.00
7120	1.00	24	776	.15	.17	.16	.12	.07	.04	.02	.01	1.00
7120	9.00	24	776	.00	-.02	-.07	-.15	-.27	-.42	-.56	-.69	1.00
7120	17.00	24	776	-.77	-.79	-.74	-.64	-.49	-.34	-.19	-.08	1.00
7120	1.00	25	776	-.01	.02	.02	.01	.01	.03	.08	.13	1.00
7120	9.00	25	776	.18	.20	.18	.09	-.05	-.24	-.44	-.62	1.00
7120	17.00	25	776	-.76	-.83	-.83	-.76	-.64	-.50	-.37	-.27	1.00
7120	1.00	26	776	-.20	-.17	-.15	-.13	-.09	-.01	.10	.23	1.00
7120	9.00	26	776	.34	.42	.43	.35	.20	-.03	-.28	-.53	1.00
7120	17.00	26	776	-.74	-.87	-.91	-.87	-.76	-.63	-.50	-.40	1.00
7120	1.00	27	776	-.34	-.31	-.30	-.28	-.22	-.11	.04	.23	1.00
7120	9.00	27	776	.41	.55	.61	.57	.41	.17	-.14	-.45	1.00
7120	17.00	27	776	-.71	-.89	-.97	-.94	-.83	-.67	-.51	-.39	1.00
7120	1.00	28	776	-.32	-.31	-.33	-.35	-.33	-.25	-.10	.10	1.00

7120	9.00	28	776	.33	.55	.65	.60	.55	.29	-.04	-.40	1.00
7120	17.00	28	776	-.72	-.94	-1.03	-.99	-.34	-.63	-.40	-.23	1.00
7120	1.00	29	776	-.13	-.12	-.19	-.28	-.36	-.37	-.30	-.13	1.00
7120	9.00	29	776	.10	.34	.52	.59	.52	.31	-.02	-.39	1.00
7120	17.00	29	776	-.74	-1.00	-1.11	-1.05	-.85	-.55	-.22	.05	1.00
7120	1.00	30	776	.21	.25	.15	-.06	-.26	-.42	-.48	-.41	1.00
7120	9.00	30	776	-.23	.00	.23	.36	.40	.25	-.03	-.40	1.00
7120	17.00	30	776	-.76	-1.05	-1.17	-1.11	-.86	-.49	-.06	.32	1.00
7120	1.00	31	776	.57	.65	.53	.26	-.06	-.38	-.60	-.68	1.00
7120	9.00	31	776	-.60	-.39	-.14	.09	.20	.16	-.04	-.36	1.00
7120	17.00	31	776	-.72	-1.03	-1.19	-1.15	-.90	-.49	.01	.49	1.00

ii) File reference number 11 output: the hourly current directions for the period of 0100 PST July 1, 1976 to 2400 PST July 5, 1976 followed by the east/west hourly current components for the period of 0100 PST July 1, 1976 to 2400 PST July 31, 1976.

STN	1ST HR	DATE	1	2	3	4	5	6	7	8	DT HRS
7120	1.00	1 776	181.74	184.94	334.95	347.49	341.67	271.31	192.92	184.90	1.00
7120	9.00	1 776	181.89	180.02	178.38	176.29	171.31	43.98	4.58	.94	1.00
7120	17.00	1 776	359.08	357.45	355.36	350.86	308.23	189.68	183.27	181.02	1.00
7120	1.00	2 776	179.76	179.03	180.56	348.56	349.62	343.05	283.40	193.98	1.00
7120	9.00	2 776	185.00	181.71	179.69	177.93	175.60	168.44	11.75	1.38	1.00
7120	17.00	2 776	358.87	357.19	355.42	352.60	343.41	203.20	183.87	180.27	1.00
7120	1.00	3 776	178.40	176.98	175.52	173.10	355.62	351.34	345.49	318.93	1.00
7120	9.00	3 776	203.23	187.09	182.52	180.07	178.17	175.86	164.58	1.87	1.00
7120	17.00	3 776	358.24	356.57	355.09	353.14	349.06	311.62	186.04	179.90	1.00
7120	1.00	4 776	177.65	176.20	174.98	173.66	171.47	356.39	350.99	347.23	1.00
7120	9.00	4 776	338.86	287.63	197.81	185.75	181.61	179.32	177.50	7.89	1.00
7120	17.00	4 776	356.85	355.65	354.60	353.34	351.25	344.47	196.80	180.12	1.00
7120	1.00	5 776	177.39	176.11	175.30	174.73	174.41	175.02	341.81	349.21	1.00
7120	9.00	5 776	348.56	346.55	341.67	320.00	205.39	185.62	181.48	181.19	1.00
7120	17.00	5 776	350.89	354.19	354.03	353.48	352.56	350.51	334.47	131.73	1.00

STN	1ST HR	DATE	1	2	3	4	5	6	7	8	DT HRS
7120	1.00	1 776	-4.78	-1.99	.63	2.16	1.98	.02	-3.32	-7.19	1.00
7120	9.00	1 776	-10.54	-12.39	-12.08	-9.44	-4.88	.73	6.25	10.54	1.00
7120	17.00	1 776	12.73	12.43	9.80	5.54	.65	-3.74	-6.72	-7.76	1.00
7120	1.00	2 776	-6.86	-4.52	-1.57	1.02	2.41	2.13	.18	-2.95	1.00
7120	9.00	2 776	-6.43	-9.28	-10.62	-9.94	-7.21	-2.88	2.17	6.87	1.00
7120	17.00	2 776	10.21	11.59	10.47	7.42	3.05	-1.62	-5.60	-8.06	1.00
7120	1.00	3 776	-8.61	-7.32	-4.73	-1.64	1.03	2.53	2.48	.89	1.00

7120	9.00	3	776	-1.76	-4.69	-7.04	-8.06	-7.33	-4.86	-1.11	3.12	1.00
7120	17.00	3	776	6.89	9.32	9.84	8.30	5.01	.67	-3.79	-7.44	1.00
7120	1.00	4	776	-9.56	-9.81	-8.29	-5.49	-2.19	.78	2.71	3.21	1.00
7120	9.00	4	776	2.26	.27	-2.11	-4.12	-5.09	-4.63	-2.74	.21	1.00
7120	17.00	4	776	3.52	6.40	8.07	8.05	6.19	2.61	-1.47	-5.79	1.00
7120	1.00	5	776	-9.27	-11.25	-11.35	-9.66	-6.60	-2.91	.61	3.23	1.00
7120	9.00	5	776	4.49	4.30	2.92	.91	-1.03	-2.28	-2.39	-1.27	1.00
7120	17.00	5	776	.81	3.30	5.49	6.67	6.36	4.39	1.00	-3.25	1.00
7120	1.00	6	776	-7.53	-11.01	-12.96	-12.99	-11.09	-7.66	-3.39	.85	1.00
7120	9.00	6	776	4.28	6.33	6.77	5.76	3.80	1.57	-.23	-1.09	1.00
7120	17.00	6	776	-.77	.59	2.51	4.33	5.34	4.99	3.06	-.31	1.00
7120	1.00	7	776	-4.58	-8.94	-12.49	-14.47	-14.39	-12.18	-8.24	-3.28	1.00
7120	9.00	7	776	1.74	5.92	8.55	9.30	8.28	5.98	3.15	.61	1.00
7120	17.00	7	776	-.98	-1.29	-.36	1.37	3.18	4.31	4.11	2.27	1.00
7120	1.00	8	776	-1.11	-5.43	-9.98	-13.65	-15.60	-15.30	-12.65	-8.07	1.00
7120	9.00	8	776	-2.41	3.29	7.97	10.81	11.45	10.00	7.04	3.45	1.00
7120	17.00	8	776	.20	-1.95	-2.55	-1.65	.24	2.34	3.75	3.73	1.00
7120	1.00	9	776	1.92	-1.56	-6.11	-10.78	-14.49	-16.28	-15.58	-12.36	1.00
7120	9.00	9	776	-7.11	-.83	5.30	10.11	12.75	12.66	10.66	6.89	1.00
7120	17.00	9	776	2.58	-1.18	-3.53	-4.04	-2.83	-.51	1.98	3.65	1.00
7120	1.00	10	776	3.70	1.77	-1.94	-6.73	-11.50	-15.09	-16.51	-15.24	1.00
7120	9.00	10	776	-11.33	-5.46	1.26	7.49	12.04	14.07	13.36	10.29	1.00
7120	17.00	10	776	5.75	.94	-2.98	-5.15	-5.24	-3.50	-.70	2.10	1.00
7120	1.00	11	776	3.84	3.72	1.48	-2.55	-7.52	-12.23	-15.46	-16.28	1.00
7120	9.00	11	776	-14.27	-9.66	-3.30	3.56	9.54	13.45	14.60	12.94	1.00
7120	17.00	11	776	9.04	3.97	-.99	-4.69	-6.36	-5.83	-3.53	-.37	1.00
7120	1.00	12	776	2.50	4.02	3.50	.83	-3.49	-8.48	-12.87	-15.46	1.00
7120	9.00	12	776	-15.49	-12.67	-7.46	-.86	5.79	11.14	14.13	14.25	1.00
7120	17.00	12	776	11.67	7.17	1.90	-2.84	-5.99	-6.96	-5.77	-3.03	1.00
7120	1.00	13	776	.24	2.89	3.95	2.91	-.17	-4.61	-9.34	-13.12	1.00
7120	9.00	13	776	-14.88	-13.99	-10.46	-4.90	1.58	7.64	12.02	13.90	1.00
7120	17.00	13	776	12.99	9.67	4.86	-.24	-4.42	-6.80	-7.00	-5.25	1.00
7120	1.00	14	776	-2.29	.84	3.06	3.56	2.04	-1.25	-5.53	-9.69	1.00
7120	9.00	14	776	-12.62	-13.43	-11.74	-7.75	-2.22	3.71	8.79	11.98	1.00
7120	17.00	14	776	12.68	10.86	7.07	2.30	-2.30	-5.71	-7.23	-6.72	1.00
7120	1.00	15	776	-4.57	-1.59	1.22	2.94	2.97	1.18	-2.02	-5.81	1.00
7120	9.00	15	776	-9.18	-11.16	-11.12	-8.88	-4.82	.23	5.21	9.05	1.00
7120	17.00	15	776	10.95	10.56	8.07	4.13	-.30	-4.20	-6.72	-7.43	1.00
7120	1.00	16	776	-6.36	-3.99	-1.13	1.32	2.64	2.40	.64	-2.15	1.00
7120	9.00	16	776	-5.23	-7.70	-8.82	-8.17	-5.77	-2.08	2.11	5.89	1.00

7120	17.00	16	776	8.39	9.09	7.85	4.98	1.17	-2.71	-5.81	-7.51	1.00
7120	1.00	17	776	-7.55	-6.10	-3.67	-.99	1.19	2.30	2.08	.65	1.00
7120	9.00	17	776	-1.53	-3.80	-5.46	-5.96	-5.07	-2.91	.08	3.20	1.00
7120	17.00	17	776	5.72	7.02	6.77	4.99	2.04	-1.43	-4.70	-7.07	1.00
7120	1.00	18	776	-8.12	-7.70	-6.05	-3.63	-1.09	.97	2.12	2.16	1.00
7120	9.00	18	776	1.24	-.26	-1.82	-2.91	-3.14	-2.36	-.72	1.41	1.00
7120	17.00	18	776	3.47	4.92	5.32	4.47	2.46	-.35	-3.43	-6.15	1.00
7120	1.00	19	776	-7.99	-8.01	-7.95	-6.21	-3.81	-1.28	.87	2.25	1.00
7120	9.00	19	776	2.71	2.33	1.38	.27	-.59	-.68	-.48	.52	1.00
7120	17.00	19	776	1.84	3.07	3.79	3.68	2.58	.58	-2.02	-4.76	1.00
7120	1.00	20	776	-7.13	-8.63	-9.10	-8.31	-6.49	-4.00	-1.30	1.12	1.00
7120	9.00	20	776	2.87	3.74	3.74	3.07	2.06	1.08	.45	.35	1.00
7120	17.00	20	776	.76	1.51	2.26	2.66	2.38	1.28	-.61	-3.05	1.00
7120	1.00	21	776	-5.63	-7.87	-9.31	-9.63	-8.71	-6.68	-3.90	-.83	1.00
7120	9.00	21	776	1.98	4.09	5.21	5.30	4.52	3.22	1.81	.69	1.00
7120	17.00	21	776	.12	.15	.66	1.31	1.73	1.55	.55	-1.28	1.00
7120	1.00	22	776	-3.72	-6.34	-8.61	-10.02	-10.19	-8.98	-6.52	-3.21	1.00
7120	9.00	22	776	.37	3.59	5.91	6.99	6.78	5.49	3.56	1.54	1.00
7120	17.00	22	776	-.08	-.96	-1.01	-.40	.48	1.15	1.14	.19	1.00
7120	1.00	23	776	-1.74	-4.37	-7.18	-9.54	-10.85	-10.68	-8.91	-5.75	1.00
7120	9.00	23	776	-1.75	2.38	5.88	8.13	8.79	7.88	5.76	3.02	1.00
7120	17.00	23	776	.35	-1.62	-2.53	-2.33	-1.32	-.01	.96	1.06	1.00
7120	1.00	24	776	-.03	-2.25	-5.23	-8.29	-10.68	-11.70	-10.93	-8.35	1.00
7120	9.00	24	776	-4.32	.44	5.01	8.54	10.38	10.25	8.34	5.21	1.00
7120	17.00	24	776	1.66	-1.47	-3.51	-4.12	-3.38	-1.77	.01	1.19	1.00
7120	1.00	25	776	1.19	-.25	-2.97	-6.39	-9.68	-11.93	-12.43	-10.83	1.00
7120	9.00	25	776	-7.26	-2.31	3.09	7.86	11.08	12.16	10.98	7.94	1.00
7120	17.00	25	776	3.85	-.30	-3.57	-5.30	-5.28	-3.81	-1.54	.61	1.00
7120	1.00	26	776	1.80	1.45	-.56	-3.91	-7.77	-11.15	-13.07	-12.84	1.00
7120	9.00	26	776	-10.27	-5.70	.03	5.80	10.42	12.99	13.05	10.71	1.00
7120	17.00	26	776	6.63	1.83	-2.55	-5.54	-6.61	-5.74	-3.45	-.63	1.00
7120	1.00	27	776	1.69	2.63	1.71	-1.02	-4.96	-9.14	-12.42	-13.82	1.00
7120	9.00	27	776	-12.75	-9.22	-3.81	2.41	8.17	12.27	13.90	12.82	1.00
7120	17.00	27	776	9.39	4.52	-.61	-4.79	-7.14	-7.30	-5.48	-2.44	1.00
7120	1.00	28	776	.75	3.00	3.49	1.90	-1.51	-5.92	-10.19	-13.15	1.00
7120	9.00	28	776	-13.87	-11.96	-7.63	-1.71	4.58	9.90	13.15	13.67	1.00
7120	17.00	28	776	11.47	7.16	1.84	-3.20	-6.83	-8.29	-7.44	-4.75	1.00
7120	1.00	29	776	-1.15	2.19	4.19	4.16	1.97	-1.90	-6.48	-10.55	1.00
7120	9.00	29	776	-12.98	-12.98	-10.35	-5.55	.45	6.35	10.86	13.00	1.00
7120	17.00	29	776	12.37	9.20	4.31	-1.10	-5.74	-8.59	-9.10	-7.34	1.00

7120	1.00	30	776	-3.96	-.03	3.28	4.98	4.55	2.02	-1.95	-5.34	1.00
7120	9.00	30	776	-9.93	-11.70	-11.06	-8.01	-3.14	2.47	7.56	10.97	1.00
7120	17.00	30	776	11.92	10.23	6.34	1.18	-4.02	-8.08	-10.10	-9.76	1.00
7120	1.00	31	776	-7.30	-3.49	.59	3.81	5.33	4.75	2.27	-1.42	1.00
7120	9.00	31	776	-5.28	-8.22	-9.38	-8.34	-5.24	-.76	4.06	8.06	1.00
7120	17.00	31	776	10.26	10.11	7.60	3.30	-1.84	-6.64	-10.06	-11.36	1.00

iii) File reference number 12 output: the times, magnitudes and directions of all maximum or minimum current values for the period of 0100 PST July 1, 1976 to 2400 July 31, 1976.

STN	DATE	TIME	MAG	DIR	TIME	MAG	DIR	TIME	MAG	DIR	TIME	MAG	DIR
7120	1 776	243	.25	265.7	426	2.37	346.3	600	.77	271.3	1022	12.54	179.4
7120	1 776	1352	.72	88.2	1722	12.91	358.5	2108	.81	267.8			
7120	2 776	0	7.77	181.0	333	.11	261.1	522	2.57	348.2	704	.76	271.1
7120	2 776	1111	10.66	179.4	1435	.53	89.2	1803	11.52	357.1	2139	.79	267.4
7120	3 776	46	8.64	178.8	434	.05	73.8	630	2.76	349.1	822	.79	270.3
7120	3 776	1206	8.07	179.9	1516	.27	87.6	1845	9.94	355.5	2209	.71	266.4
7120	4 776	138	9.96	176.7	543	.06	77.2	752	3.31	347.9	1008	.84	267.3
7120	4 776	1311	5.12	161.1	1556	.04	105.1	1930	8.34	354.0	2240	.57	264.4
7120	5 776	233	11.57	175.6	648	.11	262.3	922	4.69	348.0	1229	.64	263.5
7120	5 776	1435	2.49	182.7	1638	.08	263.0	2019	6.80	353.2	2315	.39	266.5
7120	6 776	330	13.25	175.9	746	.38	264.6	1046	6.90	350.7	1452	.24	262.8
7120	6 776	1613	1.12	182.3	1737	.10	262.1	2116	5.43	353.4	2355	.23	264.3
7120	7 776	428	14.72	177.1	838	.59	266.2	1153	9.38	353.8	1618	.04	263.6
7120	7 776	1743	1.33	179.0	1914	.11	265.0	2222	4.44	354.6			
7120	8 776	43	.15	268.3	522	15.77	178.8	924	.62	267.9	1246	11.52	356.3
7120	8 776	1704	.02	78.9	1852	2.56	179.0	2053	.13	265.0	2330	3.96	355.5
7120	9 776	136	.23	268.1	614	16.35	180.3	1007	.40	268.7	1332	13.12	358.4
7120	9 776	1739	.04	259.1	1946	4.08	180.3	2212	.15	267.5			
7120	10 776	32	3.93	355.1	231	.46	270.4	702	16.52	181.2	1049	.02	67.5
7120	10 776	1414	14.15	360.0	1813	.22	269.2	2032	5.47	181.8	2314	.18	273.3
7120	11 776	127	4.06	353.8	324	.73	272.0	747	16.35	181.4	1128	.52	90.6
7120	11 776	1453	14.63	.9	1847	.50	270.1	2115	6.44	182.9			
7120	12 776	7	.17	269.1	217	4.13	352.7	412	.96	272.4	830	15.84	181.2
7120	12 776	1207	.93	89.7	1532	14.56	1.0	1922	.79	270.7	2155	6.97	183.3
7120	13 776	55	.08	270.5	302	3.99	352.1	456	1.08	272.8	910	14.92	180.9
7120	13 776	1245	1.15	90.6	1610	13.94	.5	1957	1.00	269.5	2235	7.19	182.6

7120	14	776	143	.10	88.4	347	3.65	352.1	538	1.12	273.4	950	13.47	180.7
7120	14	776	1522	1.12	89.3	1646	12.75	359.3	2029	1.07	267.9	2314	7.28	180.8
7120	15	776	232	.29	83.5	433	3.21	352.1	623	1.10	274.0	1029	11.41	180.8
7120	15	776	1557	.88	88.6	1720	11.08	357.8	2056	1.01	266.1	2352	7.43	178.4
7120	16	776	326	.41	82.6	523	2.76	351.1	714	1.05	273.4	1108	8.83	181.4
7120	16	776	1430	.52	88.0	1752	9.14	355.9	2118	.89	265.9			
7120	17	776	32	7.76	176.3	426	.36	81.6	623	2.42	348.2	818	.98	271.6
7120	17	776	1152	5.97	182.5	1459	.14	86.5	1822	7.16	353.7	2137	.74	264.3
7120	18	776	113	8.18	175.1	530	.18	80.7	736	2.35	345.2	952	.83	266.6
7120	18	776	1243	3.19	165.7	1521	.18	267.0	1851	5.40	351.3	2154	.57	265.6
7120	19	776	159	8.65	175.0	633	.03	256.1	902	2.79	346.8	1220	.53	262.8
7120	19	776	1553	.96	203.4	1530	.40	265.7	1923	3.93	348.9	2215	.37	265.6
7120	20	776	251	9.14	175.8	730	.18	262.5	1030	3.88	351.5	1533	.63	301.3
7120	20	776	2007	2.73	347.2	2243	.15	264.4						
7120	21	776	345	9.67	177.2	816	.24	266.5	1135	5.41	354.6	1727	.67	275.6
7120	21	776	2113	1.79	349.2	2321	.05	97.1						
7120	22	776	437	10.29	178.6	853	.23	267.6	1219	7.07	356.2	1656	.71	270.4
7120	22	776	1830	1.27	211.2	2032	.41	280.4	2230	1.26	357.0			
7120	23	776	7	.17	85.8	523	10.97	179.5	925	.16	273.9	1254	8.80	357.3
7120	23	776	1709	.75	269.9	1916	2.65	193.7	2201	.20	277.7	2336	1.15	1.6
7120	24	776	59	.15	87.8	605	11.71	179.8	954	.01	276.7	1326	10.57	358.2
7120	24	776	1730	.79	270.8	1954	4.17	189.0	2300	.19	274.4			
7120	25	776	30	1.36	358.2	152	.01	89.7	645	12.49	179.7	1025	.20	93.4
7120	25	776	1356	12.16	358.9	1755	.83	271.0	2028	5.55	187.3	2341	.30	272.5
7120	26	776	117	1.88	354.2	246	.16	269.6	724	13.26	179.4	1100	.43	87.9
7120	26	776	1431	13.34	359.3	1823	.89	269.6	2101	6.66	186.6			
7120	27	776	14	.38	271.0	201	2.66	353.3	341	.28	269.0	805	13.84	179.0
7120	27	776	1137	.60	90.4	1506	13.91	359.3	1852	.97	270.2	2133	7.53	185.7
7120	28	776	45	.34	269.8	245	3.57	354.8	436	.34	270.4	847	13.94	178.6
7120	28	776	1216	.64	89.9	1541	13.81	358.8	1921	1.03	269.1	2207	8.33	164.1
7120	29	776	119	.12	266.5	329	4.45	357.0	533	.38	270.2	930	13.30	179.0
7120	29	776	1255	.53	88.0	1616	13.12	357.8	1947	1.08	269.3	2242	9.21	182.0
7120	30	776	200	.23	87.7	418	5.09	358.6	632	.47	270.1	1015	11.79	179.7
7120	30	776	1534	.34	89.7	1652	11.97	356.6	2013	1.07	268.4	2321	10.26	179.5
7120	31	776	251	.50	86.5	514	5.39	358.6	738	.67	270.1	1102	9.38	180.8
7120	31	776	1409	.14	91.6	1727	10.53	355.3	2039	1.01	266.7			

References

Dietrich, G. 1963. General Oceanography. Interscience Publishers, New York. 588 pp.

Doodson, A.T. and H.D. Warburg. 1941. Admiralty Manual of Tides. His Majesty's Stationery Office. London. Reprinted 1946. 270 pp.

Foreman, M.G.G. 1977. Manual for Tidal Heights Analysis and Prediction. Pacific Marine Science Report 77-10, Institute of Ocean Sciences, Patricia Bay, Victoria, B.C. 97 pp. "Unpublished Manuscript".

Godin, G.G. 1972. The Analysis of Tides. University of Toronto Press. 264 pp.

__________. 1976. The Reduction of Current Observations with the Help of the Admittance Function. Technical Note No. 14, Environment Canada, Ottawa. Marine Environmental Data Service. 13 pp.

Henry, R.F. and M.G.G. Foreman. 1977. Numerical Model Studies of Semi-diurnal Tides in the Southern Beaufort Sea. Pacific Marine Science Report 77-11, Institute of Ocean Sciences, Patricia Bay, Victoria, B.C. 71 pp. "Unpublished Manuscript".

Taylor, J. 1972. The Current Ellipse (unpublished notes). 7 pp.

OCEANOGRAPHIC OBSERVATIONS ALONG LINE P AND OFF THE COAST OF BRITISH COLUMBIA 19 AUGUST - 10 SEPTEMBER 1975

by

Offshore Oceanography Group

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1978

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ABSTRACT

Physical oceanographic observations were made along Line P to Ocean Weather Station Papa, and off the coast of British Columbia.

Observed data only are shown, including surface salinity and temperature observations, profiles obtained with bottle casts, a conductivity-temperature-pressure instrument and an expendable bathythermograph system.

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LIST OF FIGURES

INTRODUCTION

The data presented in this report was collected from one cruise as a supplement to the regular Line P weathership observations.

The vessel used during this cruise was the CFAV Endeavour. Personnel from and on contract to the Offshore Oceanography Group participated in this cruise (Cruise ref. No. 75-10).

The first phase was from 19 August to 28 August 1975. The second phase was from 30 August to 10 September 1975.

STD, XBT and surface observations were made along Line P, and on lines parallel to Line P with stations on same longitude as Line P stations (fig. 1).

The ship was equipped with a Plessey Model 6600T thermosalinograph which was used for continuous recording of surface temperature and salinity from the ship's seawaterloop. Requests for these data should be directed to the Institute of Ocean Sciences.

The following Pacific Marine Science Reports were published using data observed during this cruise:

Wood, Wayne, Practical accuracy of Sippican T-7 XBT's.

Tabata, S. An examination of the quality of sea-surface temperatures and salinities observed recently in the Northeast Pacific Ocean.

OBSERVATIONAL PROCEDURES

Observations for salinity, oxygen and temperature from all hydrographic casts, including the surface, were obtained with Niskin water sample bottles equipped with either Richter and Wiese and/or Yoshino Keiki Co. reversing thermometers. Two protected thermometers were used on all bottles and one unprotected thermometer was used on each bottle at depths of 300 m or greater. The accuracy of protected reversing thermometers is believed to be ±0.02°C.

At each STD and XBT station a surface salinity sample was taken from a bucket and the ship's seawaterloop.

The surface water temperatures were measured from a bucket sample using a deck thermometer of ±0.1°C accuracy.

Salinity determinations were made aboard ship with a Hytech Model 6220 lab salinometer. Accuracy using duplicated determinations is estimated to be ±0.003°/₀₀.

Depth determinations were made using the "depth difference" method described in the U.S.N. Hydrographic Office Publication No. 607 (1955). Depth estimates have an approximate accuracy of ±5 m for depths less than 1000 m, and ±0.5% of depth for depths greater than 1000 m.

The dissolved oxygen analyses were done in the shipboard laboratory by a modified Winkler method (Carpenter, 1955).

STD profiles were taken with a Guildline Model 8701 STP system. The accuracy of this instrument is believed to be ±0.01°C for temperature and ±0.01°/₀₀ for salinity.

XBT observations were made with a Sippican Expendable Bathythermograph System, consisting of a Model MK2A Recorder, a LM-3A hand-held launcher and T7 probes. The accuracy of this instrument is believed to be ±0.2°C for temperature and ±2% for depth.

COMPUTATIONS

All hydrographic data were processed with the aid of an IBM 370 computer and a UNIVAC 1100 computer. Reversing thermometer temperature corrections, thermometric depth calculations and accepted depth from the "depth difference" method were computed. Extraneous thermometric depths caused by thermometer malfunctions were automatically edited and replaced. A Calcomp 565 Offline Plotter was used to plot temperature-salinity, and temperature-oxygen diagrams, as well as plots of temperature, salinity, and dissolved oxygen vs $\log_{10}$ depth. These plots were used to check the data for errors.

Missing hydrographic data were obtained using a weighted parabolas interpolation method (Reiniger and Ross, 1968). These data are indicated with an asterisk in this data record.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from punch card and magnetic tape records.

Analog records from the salinity-temperature-pressure and bathythermograph instruments have been machine digitized, then replotted using the Calcomp plotter.

Digitization was continued until original and computer plotted traces were coincident. Temperature and salinity values were listed at standard pressures, computed from the entire array of digitized data.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/kg)
POT EN	is potential energy in units of 10^8 ergs/cm^2
OXY	is the concentration of dissolved oxygen expressed in millilitres per litre
SOUND	is the velocity of sound in m/sec.

REFERENCES

Carpenter, J.H., 1965. The Chesapeake Bay Institute technique for the Winkler dissolved oxygen method. Limnol. and Oceanogr. 10:141-143.

Collins, C.A., R.L. Tripe, D.A. Healey and J. Joergensen, 1969. The time distribution of serial oceanographic data from the Ocean Station P programme. Fish. Res. Bd. Can. Tech. Rept. No. 106.

Reiniger, R.F. and C.K. Ross, 1968. A method of interpolation with application to oceanographic data. Deep Sea Res. 15:185-193.

U.S.N. Hydrographic Office, 1955. Instruction Manual of Oceanographic Observations, Publ. No. 607.

Station No. and Positions

Station No.	Latitude(°N)	Longitude(°W)	STD	XBT	DATE	STD TIME	XBT TIME
1	48° 33'	125° 33'	1	-	19-08-75	1600	-
2	48° 38'	126° 00'	2	1	19-08	1920	1935
3	48° 42'	126° 40'	3	2	19-08	2200	2218
4	48° 46'	127° 40'	4	3	20-08	0700	0751
5	48° 51'	128° 40'	5	4	20-08	1145	1235
5A	48° 57'	129° 40'	-	5	20-08	-	1650
6	49° 02'	130° 40'	6	6	20-08	2055	2340
6A	49° 06'	131° 40'	-	7	21-08	-	0334
7	49° 10'	132° 40'	8	8	21-08	0720	0757
7A	49° 14'	133° 40'	-	9	21-08	-	1148
8	49° 17'	134° 40'	9	10	21-08	1550	1650
8A	49° 21'	135° 40'	-	11	21-08	-	2030
9	49° 26'	136° 40'	11	12	22-08	0015	0055
9A	49° 30'	137° 40'	-	13	22-08	-	0430
10	49° 34'	138° 40'	12	14	22-08	0815	0910
10A	49° 38'	139° 40'	-	15	22-08	-	1423
11	49° 41'	140° 40'	13	16	22-08	2210	2241
11A	49° 45'	141° 40'	-	17	23-08	-	0225
12	49° 49'	142° 40'	14	18	23-08	0615	0650
12A	49° 55'	143° 40'	-	19	23-08	-	1030
P	50° 00'	145° 00'	15	20	23-08	1545	2005
13	51° 00'	145° 00'	-	21	24-08	-	0118
14	52° 00'	145° 00'	17	22	24-08	0600	0700
15	51° 55'	143° 40'	-	23	24-08	-	1100
16	51° 49'	142° 40'	18	24	24-08	1430	1515
17	51° 45'	141° 40'	-	25	24-08	-	1835
18	51° 41'	140° 40'	19	26	24-08	2140	2229
19	51° 38'	139° 40'	-	27	25-08	-	0150
20	51° 34'	138° 40'	20	28	25-08	0630	0702
21	51° 30'	137° 40'	-	29	25-08	-	1020
22	51° 26'	136° 40'	21	30	25-08	1330	1420
23	51° 21'	135° 40'	-	31	25-08	-	1745
24	51° 17'	134° 40'	22	32	25-08	2125	2200
25	51° 14'	133° 40'	-	33	26-08	-	0115
26	51° 10'	132° 40'	23	34	26-08	0430	0536
27	51° 36'	131° 40'	-	35	26-08	-	0906
28	51° 48'	131° 07'	24	36	26-08	1150	1310
29	51° 24'	130° 55'	-	37	26-08	-	1505
30	51° 02'	130° 40'	25	38	26-08	1735	1820
31	50° 31'	129° 50'	26	39	26-08	2235	2320
32	49° 51'	128° 40'	27	40	27-08	0620	0715
33	49° 17'	127° 40'	28	41	27-08	1210	1314
3	48° 42'	126° 40'	29	42	27-08	1900	1932
2	48° 38'	126° 00'	30	-	27-08	2155	-
1	48° 33'	125° 33'	31	-	28-08	0410	-
34	48° 03	125° 20'	32	-	28-08	0725	-
32	49° 51	128° 40	33	-	30-08	1600	-
35	49° 57	129° 40	-	43	31-08	-	0754
36	50° 02	130° 40	34	44	31-08	1108	1150

Station No.	Latitude(°N)	Longitude(°W)	STD	XBT	DATE	STD TIME	XBT TIME
37	50° 06'	131° 40'	35	–	31-08-75	1535	–
38	50° 10'	132° 40'	36	–	31-08	1945	–
39	50° 14'	133° 40'	37	–	01-09	0003	–
40	50° 17'	134° 40'	38	45	01-09	0400	0425
41	50° 21'	135° 40'	39	–	01-09	0755	–
42	50° 26'	136° 40'	40	–	01-09	1200	–
			41		no observation		
43	50° 30'	137° 40'	42	46	01-09	1644	1710
44	50° 34'	138° 40'	43	–	01-09	2045	–
45	50° 38'	139° 40'	44	47	02-09	0135	0205
46	50° 41'	140° 40'	45	48	02-09	0530	0600
47	51° 11'	140° 40'	–	49	02-09		0845
18	51° 41'	140° 40'	46	50	02-09	1110	1150
48	52° 11'	140° 40'	–	51	02-09	–	1419
49	52° 41'	140° 40'	47	52	02-09	1655	1730
50	53° 11'	140° 40'	–	53	02-09	–	2002
51	53° 41'	140° 40'	48	54	02-09	2232	2315
52	54° 11'	140° 40'	–	55	03-09	–	0138
53	54° 41'	140° 40'	49	56	03-09	0415	0445
54	54° 41'	139° 40'	–	57	03-09	–	0733
55	54° 41'	138° 40'	50	58	03-09	1030	1115
56	54° 41'	137° 40'	–	59	03-09	–	1417
57	54° 41'	136° 40'	51	60	03-09	1730	1800
58	54° 41'	135° 40'	52	61	03-09	2055	2140
59	54° 41'	134° 40'	53	62	04-09	0025	0100
60	54° 41'	134° 05'	54	–	04-09	0250	–
61	54° 38'	133° 29'	55	–	04-09	0519	–
62	54° 20'	133° 14'	56	63	04-09	0725	0750
63	53° 14'	133° 40'	57	64	05-09	1029	1120
64	53° 17'	134° 40'	58	65	05-09	1510	1535
65	53° 21'	135° 40'	–	66	05-09	–	1915
66	53° 26'	136° 40'	59	67	05-09	2220	2255
67	53° 30'	137° 40'	–	68	06-09	–	0225
68	53° 34'	138° 40'	60	69	06-09	0554	0645
69	53° 38'	139° 40'	–	70	06-09	–	1025
51	53° 41'	140° 40'	61	71	06-09	1425	1500
70	53° 07'	139° 40'	–	72	06-09	–	1955
71	52° 34'	138° 40'	62	73	07-09	0010	0040
72	52° 30'	137° 40'	63	74	07-09	0330	0400
73	52° 26'	136° 40'	64	75	07-09	0655	0740
74	52° 21'	135° 40'	65	76	07-09	1032	1115
75	52° 17'	134° 40'	66	77	07-09	1415	1450
76	52° 14'	133° 40'	67	78	07-09	1800	2015

Station No.	Latitude(°N)	Longitude(°W)	STD	XBT	DATE	STD TIME	XBT TIME
77	52° 10'	132° 40'	69	79	07-09-75	2310	2340
78	51° 40'	132° 40'	70	80	08-09	0220	0250
26	51° 10'	132° 40'	71	81	08-09	0520	0550
79	50° 40'	132° 40'	72	82	08-09	0812	0852
38	50° 10'	132° 40'	73	83	08-09	1110	1150
80	49° 40'	132° 40'	74	84	08-09	1435	1520
7	49° 10'	132° 40'	75	85	08-09	1739	1810
81	48° 40'	132° 40'	76	86	08-09	1958	2032
82	48° 10'	132° 40'	77	87	08-09	2240	2325
83	48° 06'	131° 40'	78	88	09-09	0200	0236
84	48° 02'	130° 40'	79	89	09-09	0556	0625
85	47° 57'	129° 40'	80	90	09-09	0958	1040
86	47° 51'	128° 40'	81	91	09-09	1420	1450
87	47° 46'	127° 40'	82	92	09-09	1833	1903
88	47° 42'	126° 40'	83	93	09-09	2237	2315
89	47° 58'	126° 00'	84	94	10-09	0200	0230
90	48° 27'	124° 51'	85	-	10-09	0711	-

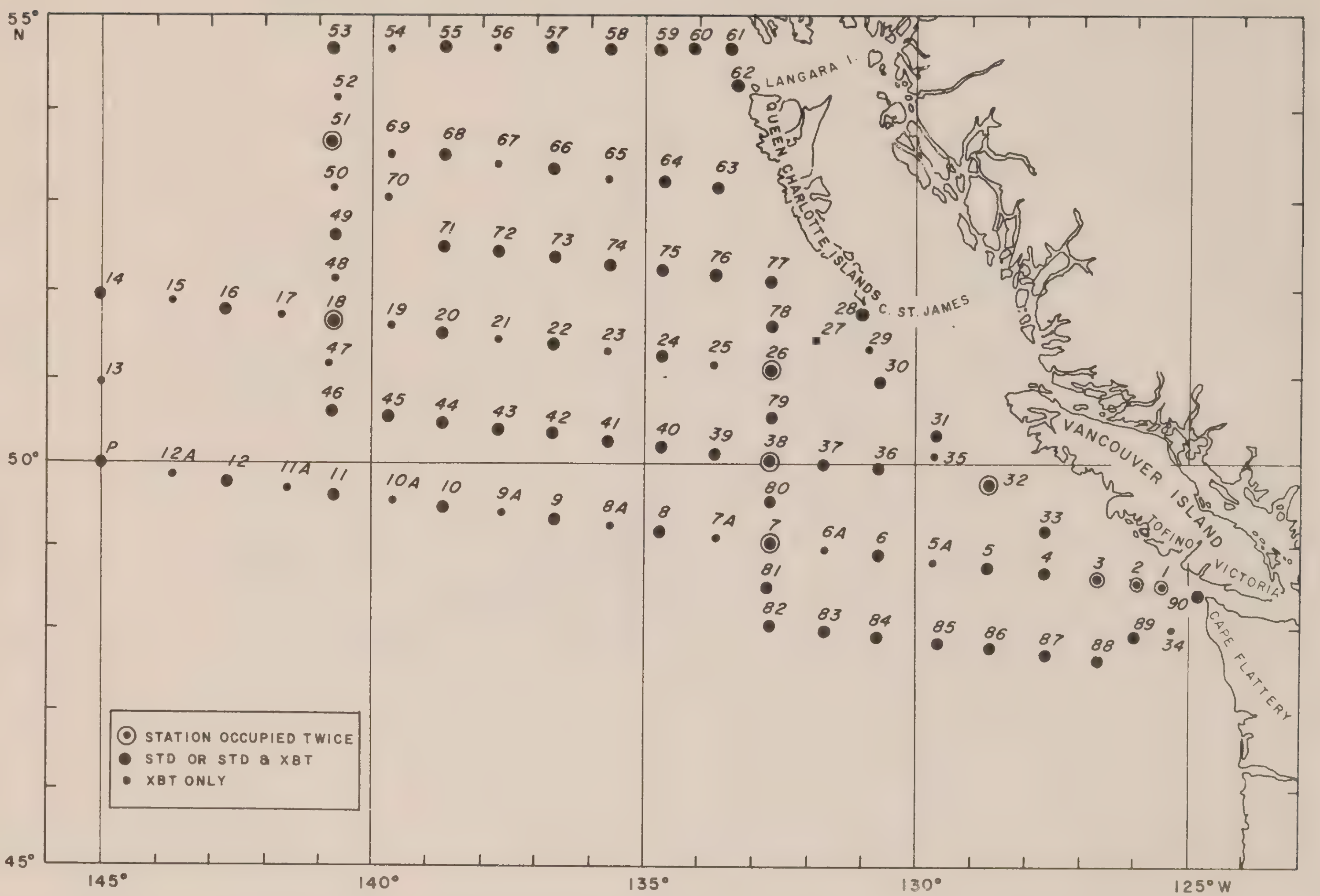
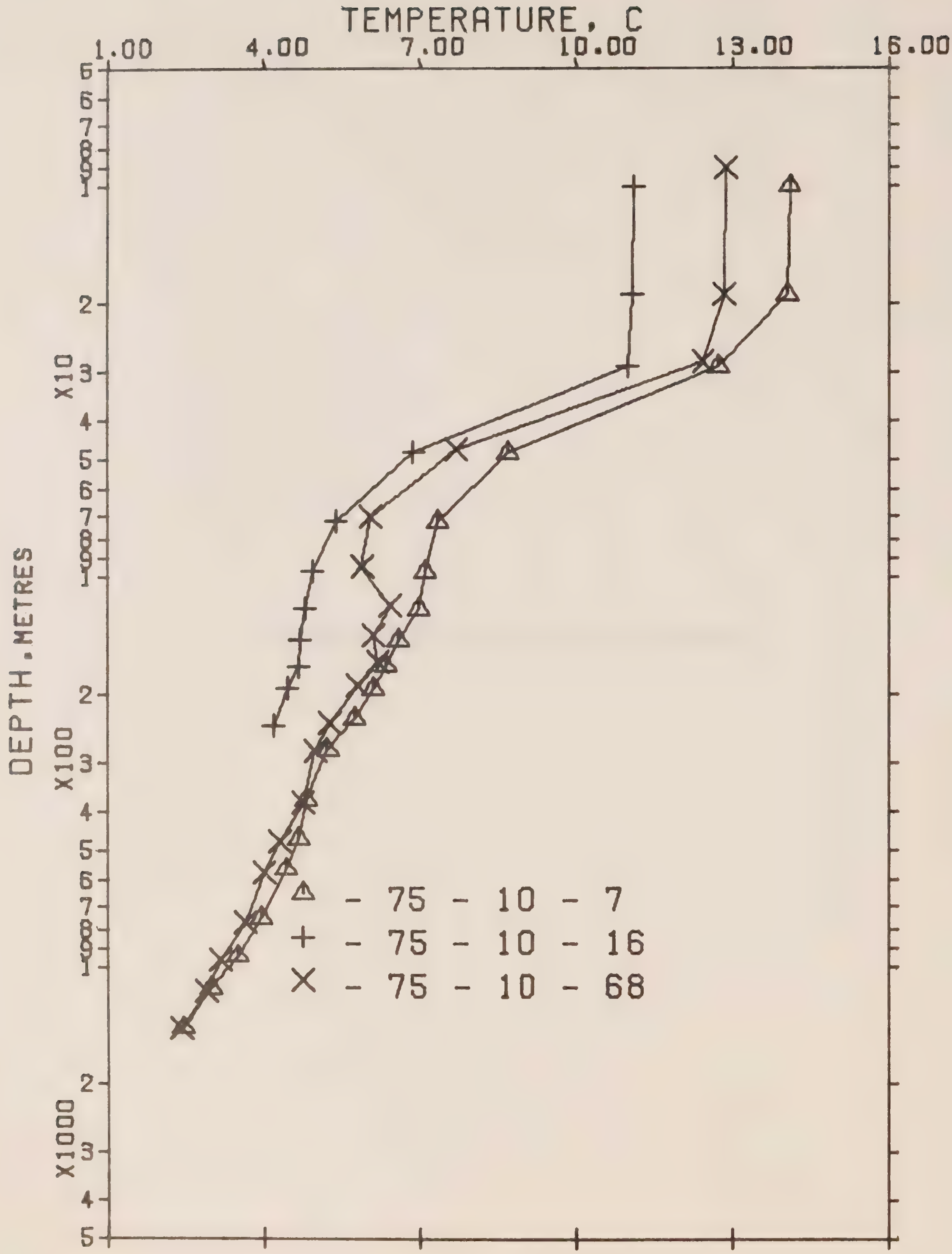
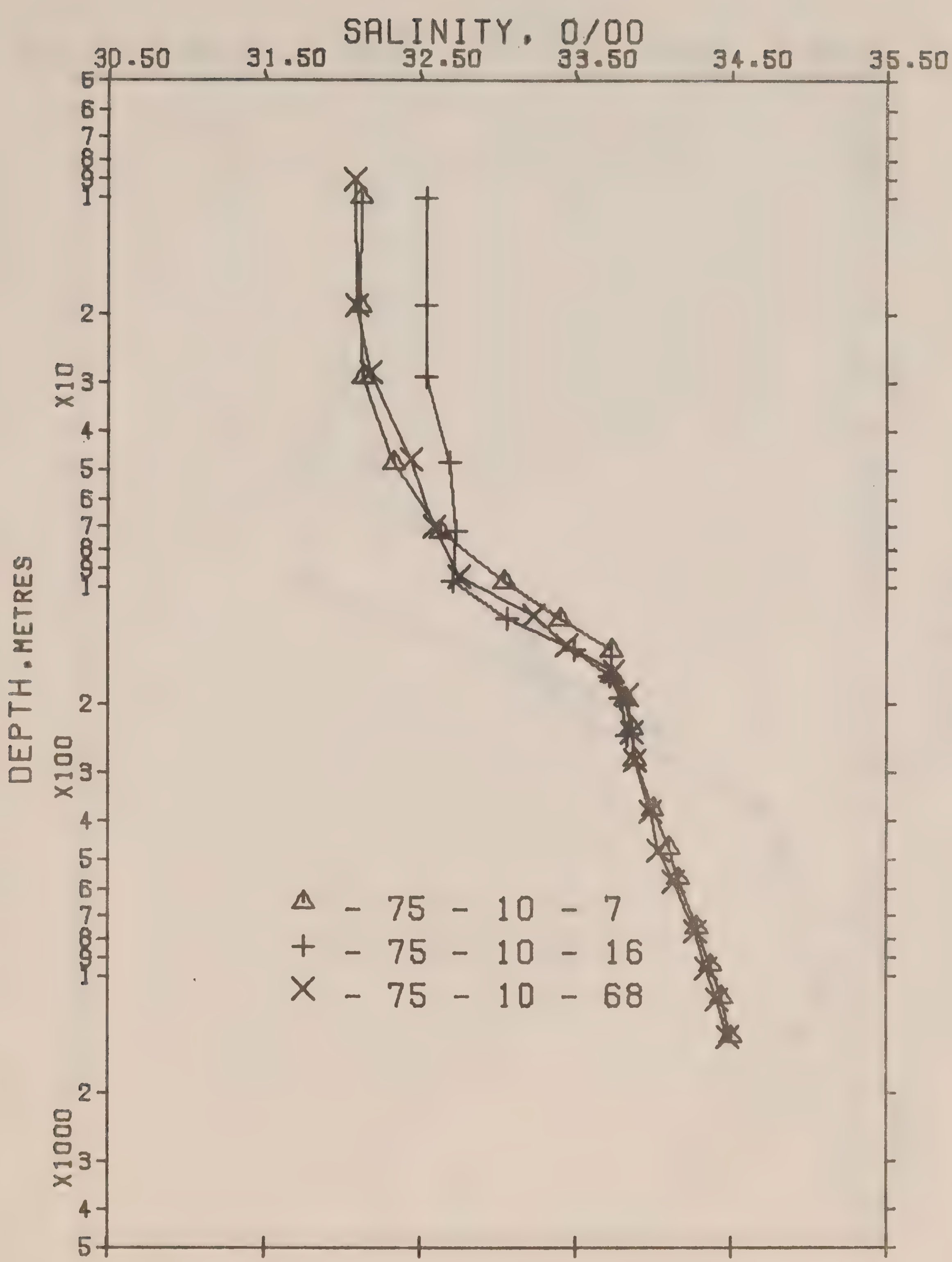


FIG. 1 Chart showing station positions.

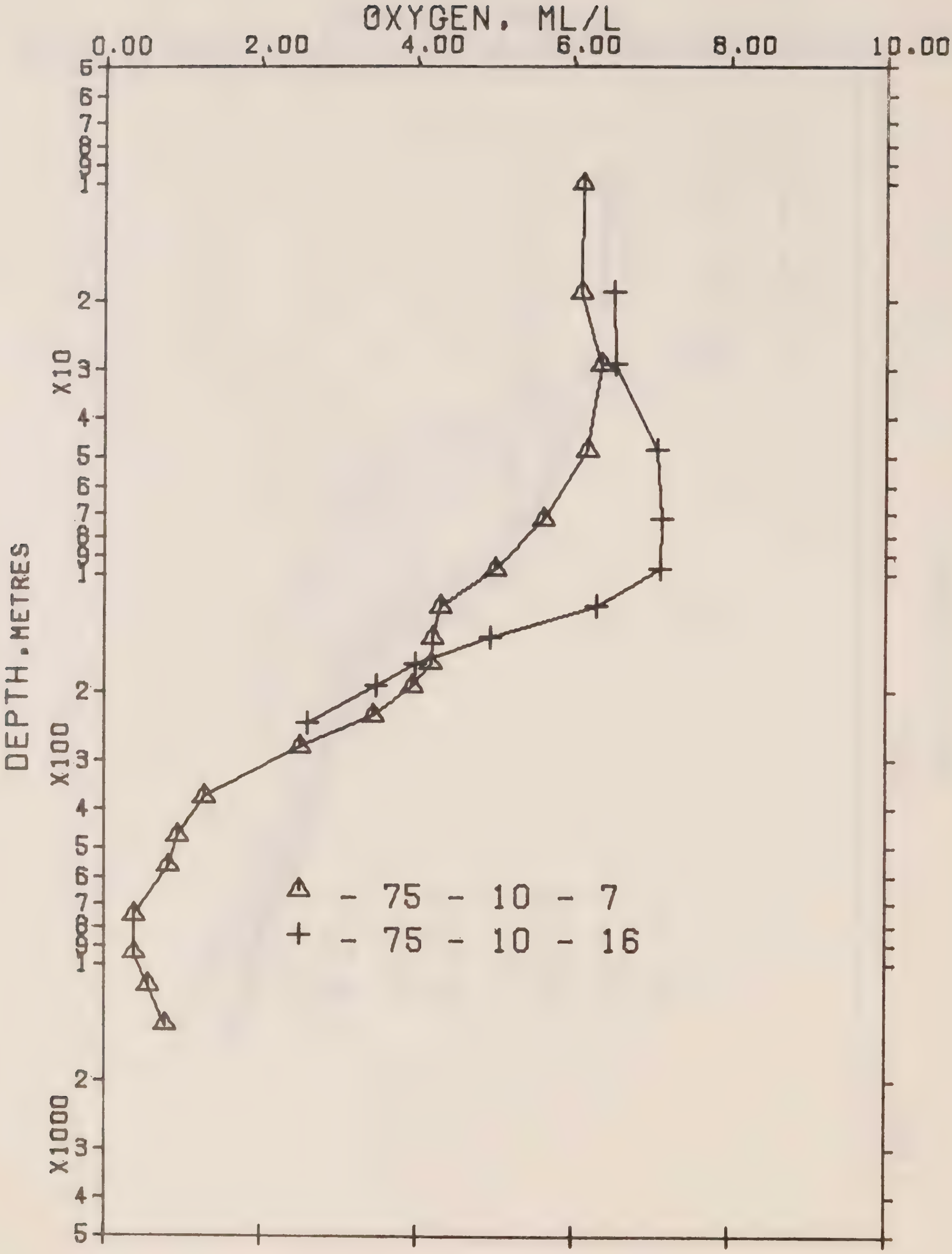
RESULTS OF HYDROGRAPHIC OBSERVATIONS



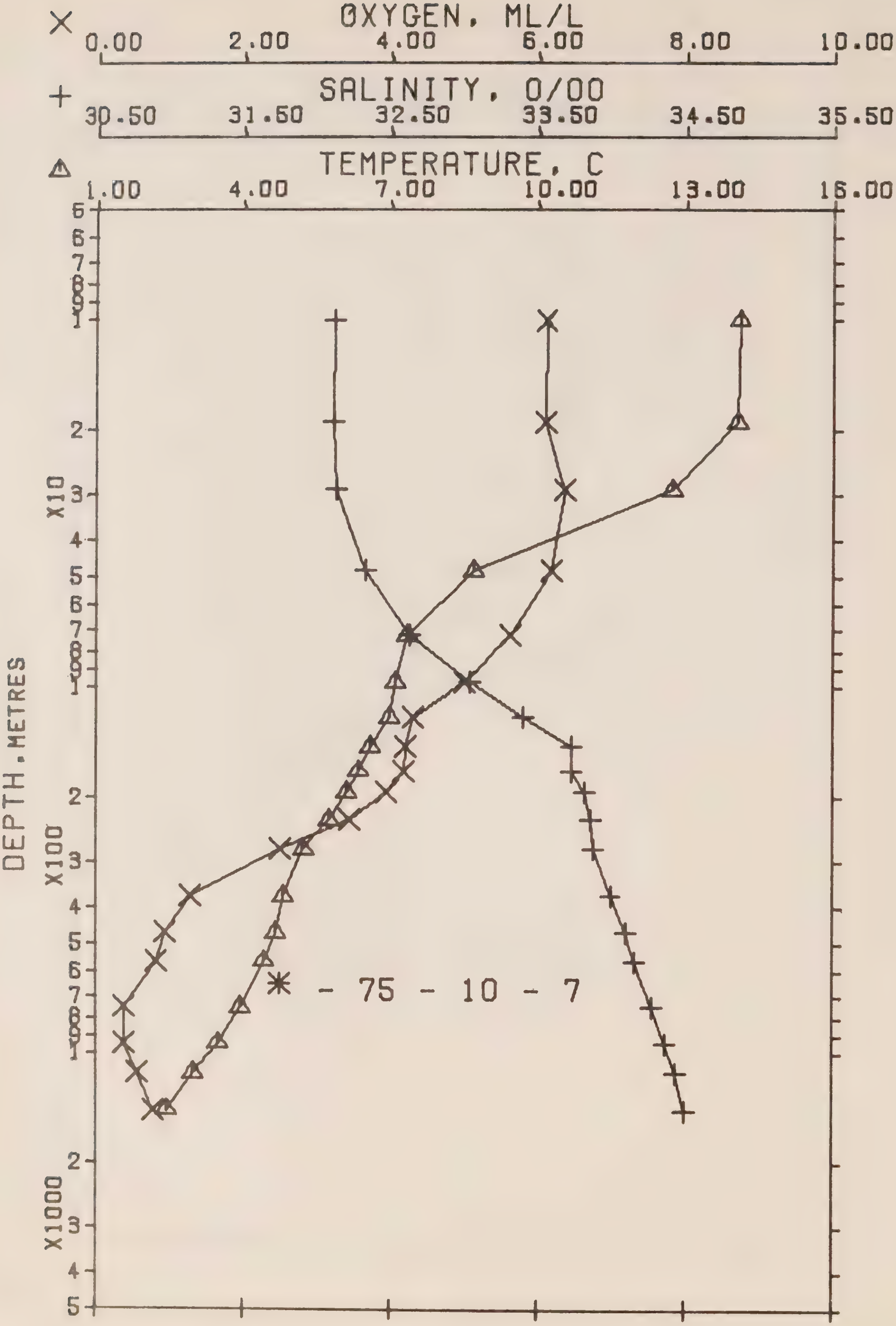
Composite plot of temperature vs Log_{10} depth.



Composite plot of salinity vs Log_{10} depth.



Composite plot of oxygen vs Log_{10} depth.


OXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH.METRES
X10
X100
X1000
- 75 - 10 - 7

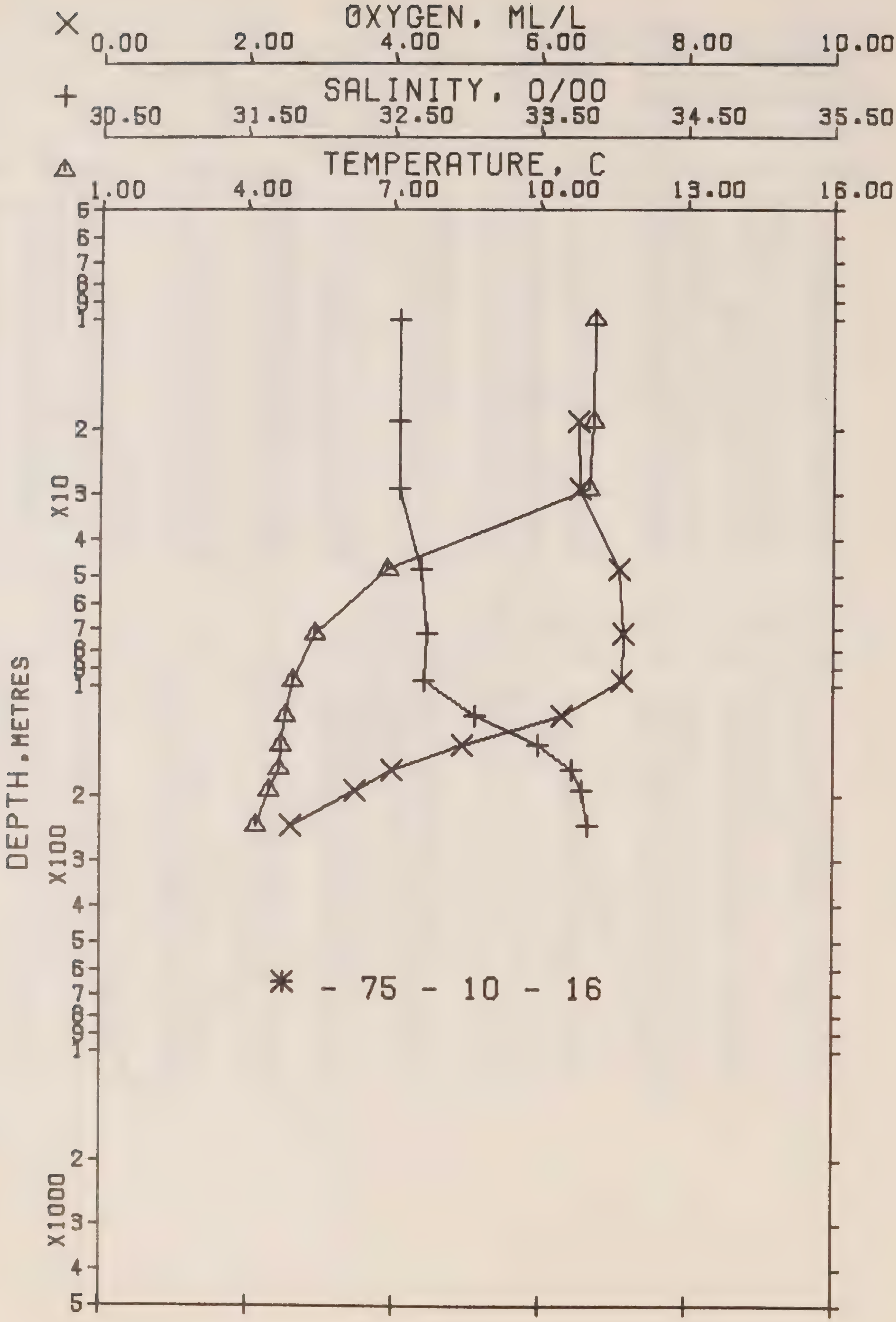
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75- 10- 7 DATE 20/ 8/75 GMT 22.0
POSITION 49- 2.0 N, 130-40.0 W STATION 6
HYDROGAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	14.16	32.121	0	23.956	396.1	14.16	396.1	.00	.00	6.12	1501.
10	14.11	32.121	10	23.966	395.4	14.11	395.1	.40	.02	6.12	1501.
19	14.07	32.117	19	23.971	395.1	14.07	394.6	.76	.07	6.11	1501.
29	12.74	32.135	29	24.250	368.7	12.74	368.0	1.14	.17	6.36	1497.
48	8.70	32.335	48	25.104	287.6	8.69	286.7	1.77	.41	6.20	1483.
72	7.34	32.630	72	25.532	247.1	7.33	246.0	2.41	.81	5.64	1478.
98	7.12	33.045	97	25.887	213.6	7.11	212.2	2.99	1.31	5.01	1479.
122	6.98	33.408	121	26.191	185.1	6.97	183.3	3.47	1.84	4.32	1479.
146	6.60	33.739	145	26.502	155.9	6.59	153.7	3.88	2.40	4.20	1478.
170	6.36	33.739	169	26.534	153.2	6.34	150.7	4.26	3.01	4.19	1478.
194	6.10	33.820	193	26.631	144.2	6.08	141.5	4.62	3.67	3.96	1477.
232	5.77	33.862	230	26.705	137.5	5.75	134.4	5.14	4.81	3.44	1476.
279	5.23	33.885	277	26.788	129.9	5.21	126.5	5.77	6.46	2.51	1475.
375	4.82	34.000	372	26.926	117.6	4.79	113.4	6.96	10.39	1.29	1475.
471	4.68	34.105	467	27.025	109.1	4.64	103.9	8.04	15.06	.96	1476.
566	4.44	34.167	561	27.100	102.6	4.40	96.7	9.05	20.36	.83	1477.
756	3.95	34.290	749	27.249	89.6	3.89	82.5	10.87	32.58	.38	1478.
948	3.50	34.374	939	27.361	79.7	3.43	71.8	12.49	46.65	.38	1479.
1143	3.01	34.440	1132	27.460	70.7	2.93	62.4	13.96	62.26	.56	1481.
1447	2.46	34.508	1432	27.562	61.1	2.36	52.6	15.95	88.56	.79	1483.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	14.16	32.121	0	23.956	396.1	14.16	396.1	.00	.00	6.12	1501.
10	14.11	32.121	10	23.966	395.4	14.11	395.1	.40	.02	6.12	1501.
20	13.92	32.119	20	24.003	392.2	13.92	391.6	.79	.08	6.14	1501.
30	12.51	32.147	30	24.304	363.6	12.50	362.9	1.17	.18	6.35	1496.
50	8.58	32.361	50	25.142	283.9	8.57	283.1	1.82	.44	6.15	1483.
75	7.31	32.679	75	25.574	243.1	7.31	242.0	2.48	.86	5.56	1478.
100	7.10	33.086	99	25.921	210.4	7.09	208.9	3.04	1.36	4.94	1479.
125	6.92	33.457	124	26.237	180.8	6.91	178.9	3.53	1.92	4.30	1479.
150	6.56	33.739	149	26.508	155.4	6.54	153.2	3.95	2.50	4.20	1478.
175	6.30	33.756	174	26.555	151.2	6.29	148.7	4.33	3.14	4.14	1478.
200	6.05	33.827	199	26.643	143.1	6.03	140.3	4.70	3.84	3.87	1477.
225	5.82	33.855	224	26.693	138.6	5.80	135.6	5.05	4.60	3.53	1477.
250	5.55	33.871	249	26.740	134.3	5.53	131.1	5.39	5.43	3.06	1476.
300	5.13	33.913	298	26.822	126.8	5.10	123.3	6.04	7.26	2.21	1475.
400	4.78	34.030	397	26.954	115.1	4.75	110.7	7.25	11.55	1.19	1475.
500	4.60	34.125	496	27.050	107.0	4.56	101.6	8.36	16.63	.91	1476.
600	4.34	34.192	595	27.131	99.9	4.29	93.8	9.39	22.43	.74	1477.
700	4.08	34.258	694	27.210	93.0	4.03	86.2	10.36	28.82	.50	1478.
800	3.84	34.311	793	27.278	87.1	3.78	79.8	11.26	35.69	.38	1478.
900	3.60	34.355	892	27.336	82.0	3.54	74.2	12.10	43.01	.38	1479.
1000	3.36	34.393	990	27.390	77.1	3.29	69.1	12.90	50.71	.43	1480.
1200	2.90	34.454	1188	27.481	68.7	2.81	60.4	14.35	66.98	.61	1481.


OXYGEN, ML/L
0.00
2.00
4.00
6.00
8.00
10.00
SALINITY, 0/00
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH.METRES
X10
X100
X1000
* - 75 - 10 - 16

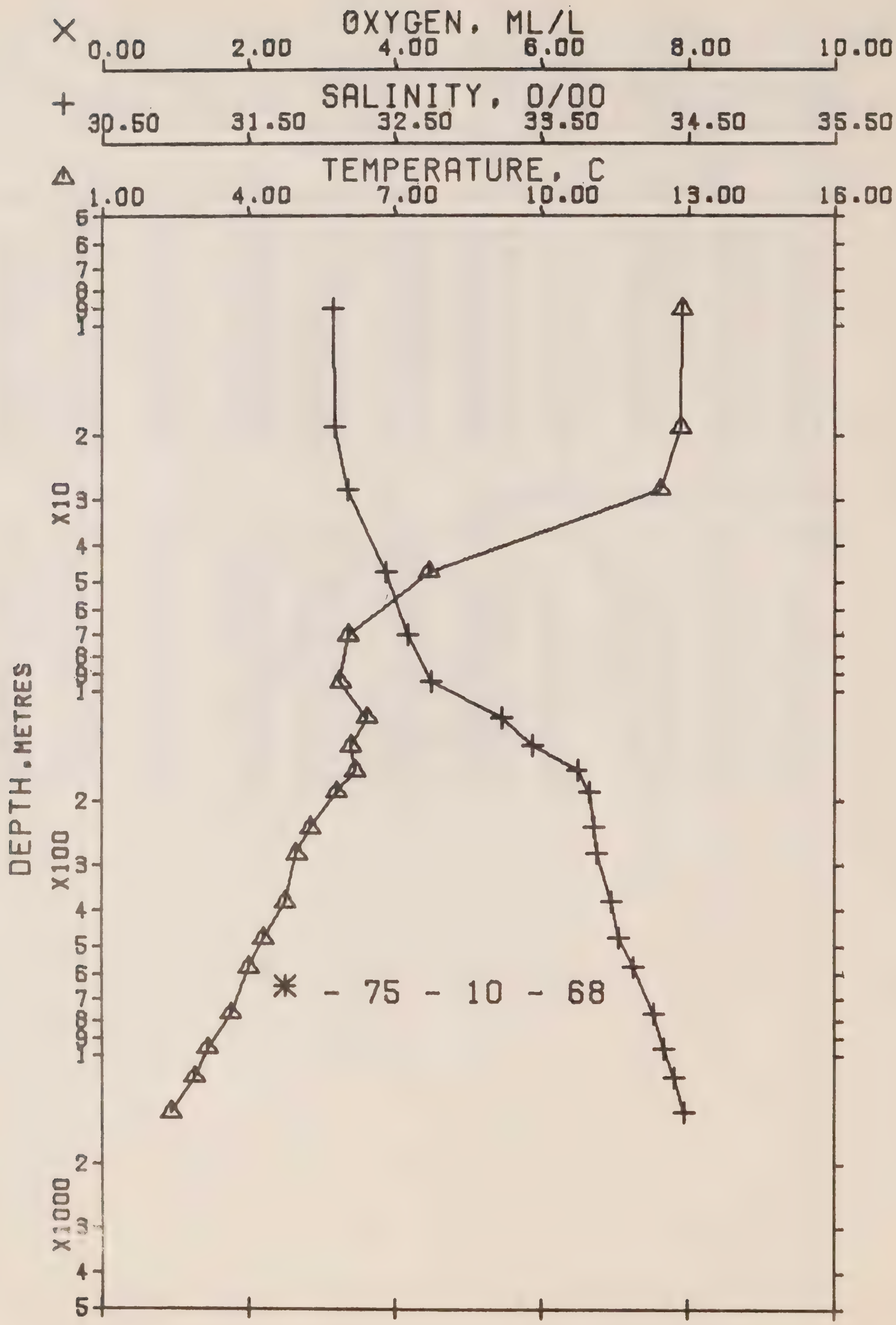
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75- 10- 16 DATE 23/ 8/75 GMT 16.8
POSITION 50- .0 N. 145- .0 W STATION P
HYDROGAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.15	32.542	0	24.860	310.0	11.15	310.0	.00	.00	6.62	1491.
10	11.12	32.543	10	24.866	309.6	11.12	309.4	.31	.02	6.55	1491.
19	11.09	32.542	19	24.871	309.4	11.09	308.9	.59	.06	6.53	1491.
29	11.01	32.543	29	24.886	308.1	11.01	307.5	.91	.14	6.56	1491.
48	6.88	32.690	48	25.641	236.3	6.88	235.6	1.43	.34	7.09	1476.
72	5.39	32.733	72	25.860	215.6	5.38	214.8	1.97	.67	7.14	1471.
98	4.94	32.715	97	25.897	212.3	4.93	211.3	2.52	1.15	7.12	1469.
122	4.80	33.063	121	26.187	184.9	4.79	183.7	3.00	1.68	6.30	1470.
146	4.71	33.498	145	26.541	151.6	4.70	150.1	3.40	2.23	4.96	1470.
170	4.68	33.722	169	26.722	134.7	4.67	132.9	3.75	2.79	3.99	1471.
194	4.47	33.797	193	26.804	127.1	4.46	125.1	4.06	3.38	3.49	1470.
243	4.18	33.836	241	26.865	121.5	4.16	119.3	4.66	4.72	2.62	1470.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.15	32.542	0	24.860	310.0	11.15	310.0	.00	.00	6.62	1491.
10	11.12	32.543	10	24.866	309.6	11.12	309.4	.31	.02	6.55	1491.
20	11.08	32.542	20	24.872	309.2	11.08	308.8	.62	.06	6.53	1491.
30	10.78	32.551	30	24.933	303.7	10.78	303.0	.93	.14	6.59	1491.
50	6.75	32.694	50	25.661	234.4	6.75	233.7	1.47	.36	7.10	1476.
75	5.34	32.731	75	25.865	215.2	5.33	214.4	2.03	.71	7.14	1471.
100	4.92	32.753	99	25.929	209.3	4.92	208.3	2.57	1.20	7.03	1469.
125	4.79	33.126	124	26.238	180.1	4.78	178.8	3.05	1.76	6.11	1470.
150	4.70	33.538	149	26.573	148.6	4.69	147.0	3.46	2.33	4.79	1470.
175	4.64	33.738	174	26.739	133.1	4.62	131.3	3.81	2.90	3.89	1471.
200	4.43	33.802	199	26.812	126.4	4.42	124.4	4.13	3.52	3.38	1470.
225	4.28	33.823	224	26.845	123.4	4.26	121.3	4.45	4.20	2.92	1470.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2.00
4.00
6.00
8.00
10.00
SALINITY, O/OO
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH.METRES
X10
X100
X1000
* - 75 - 10 - 68

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75- 10- 68 DATE 7/ 9/75 GMT 18.8
POSITION 52-14.0 N, 133-40.0 W STATION 76
HYDROGAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.91	32.089	0	24.182	374.6	12.91	374.6	.00	.00	.00	1497.
9	12.89	32.087	9	24.184	374.6	12.89	374.3	.34	.02	.00	1497.
19	12.87	32.093	19	24.193	374.0	12.87	373.5	.72	.07	.00	1497.
28	12.46	32.189	28	24.346	359.6	12.46	358.9	1.05	.15	.00	1496.
47	7.70	32.444	47	25.336	265.4	7.70	264.7	1.65	.38	.00	1479.
70	6.06	32.597	70	25.673	233.5	6.05	232.6	2.22	.72	.00	1473.
95	5.89	32.755	94	25.818	219.9	5.88	218.8	2.77	1.18	.00	1473.
119	6.43	33.236	118	26.129	190.9	6.42	189.2	3.26	1.72	.00	1476.
142	6.10	33.448	141	26.338	171.3	6.09	169.3	3.68	2.27	.00	1476.
166	6.21	33.750	165	26.562	150.4	6.20	148.1	4.07	2.88	.00	1477.
190	5.82	33.832	189	26.675	139.8	5.80	137.3	4.42	3.52	.00	1476.
239	5.27	33.864	237	26.767	131.5	5.25	128.6	5.08	4.95	.00	1474.
281	4.99	33.890	279	26.820	126.7	4.97	123.5	5.62	6.40	.00	1474.
381	4.75	33.988	378	26.924	117.7	4.72	113.5	6.84	10.50	.00	1475.
480	4.33	34.039	476	27.011	110.1	4.29	105.3	7.97	15.44	.00	1475.
577	4.01	34.131	572	27.117	100.6	3.97	95.2	8.99	20.92	.00	1475.
771	3.66	34.273	764	27.265	87.7	3.60	81.0	10.81	33.39	.00	1477.
964	3.19	34.348	955	27.370	78.3	3.12	71.0	12.41	47.52	.00	1478.
1158	2.91	34.411	1146	27.446	71.8	2.83	63.7	13.86	63.19	.00	1480.
1455	2.44	34.485	1439	27.546	62.6	2.34	54.2	15.85	89.63	.00	1483.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.91	32.089	0	24.182	374.6	12.91	374.6	.00	.00	.00	1497.
10	12.89	32.088	10	24.185	374.5	12.89	374.2	.37	.02	.00	1497.
20	12.82	32.104	20	24.211	372.3	12.82	371.8	.75	.08	.00	1497.
30	11.88	32.220	30	24.479	346.9	11.87	346.2	1.12	.17	.00	1494.
50	7.47	32.466	50	25.385	260.7	7.46	260.0	1.72	.41	.00	1478.
75	6.02	32.631	75	25.704	230.5	6.02	229.6	2.33	.80	.00	1473.
100	6.02	32.873	99	25.895	212.7	6.01	211.5	2.89	1.30	.00	1474.
125	6.33	33.297	124	26.189	185.2	6.32	183.5	3.38	1.86	.00	1476.
150	6.14	33.554	149	26.417	163.9	6.13	161.9	3.82	2.48	.00	1476.
175	6.06	33.781	174	26.606	146.3	6.05	143.9	4.20	3.11	.00	1477.
200	5.70	33.839	199	26.696	137.9	5.68	135.3	4.56	3.78	.00	1476.
225	5.41	33.856	224	26.743	133.6	5.40	130.8	4.90	4.52	.00	1475.
250	5.19	33.871	249	26.782	130.1	5.17	127.1	5.22	5.32	.00	1474.
300	4.94	33.911	298	26.842	124.8	4.91	121.4	5.86	7.10	.00	1474.
400	4.66	33.999	397	26.943	116.1	4.63	111.8	7.06	11.39	.00	1475.
500	4.26	34.059	496	27.034	108.0	4.22	103.0	8.19	16.53	.00	1475.
600	3.96	34.150	595	27.137	98.8	3.92	93.2	9.22	22.30	.00	1475.
700	3.78	34.226	694	27.216	91.9	3.73	85.7	10.17	28.62	.00	1476.
800	3.58	34.285	793	27.283	86.1	3.52	79.4	11.06	35.41	.00	1477.
900	3.33	34.325	892	27.338	81.2	3.27	74.1	11.90	42.65	.00	1478.
1000	3.13	34.361	990	27.385	77.0	3.06	69.6	12.69	50.29	.00	1479.
1200	2.84	34.423	1188	27.462	70.3	2.75	62.2	14.16	66.79	.00	1481.

RESULTS OF STD OBSERVATIONS

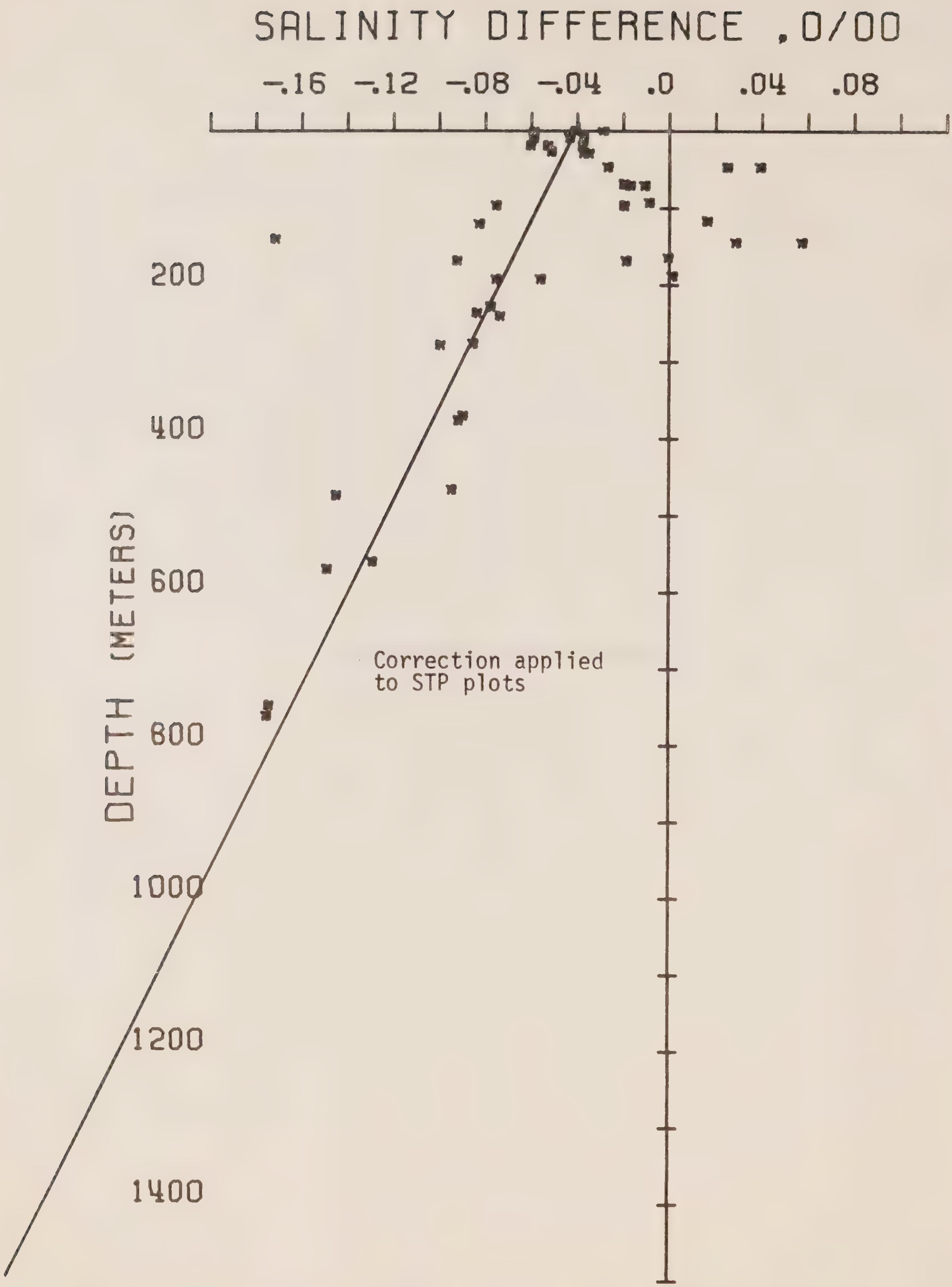


Fig. 2 Salinity difference between hydro data and STP.

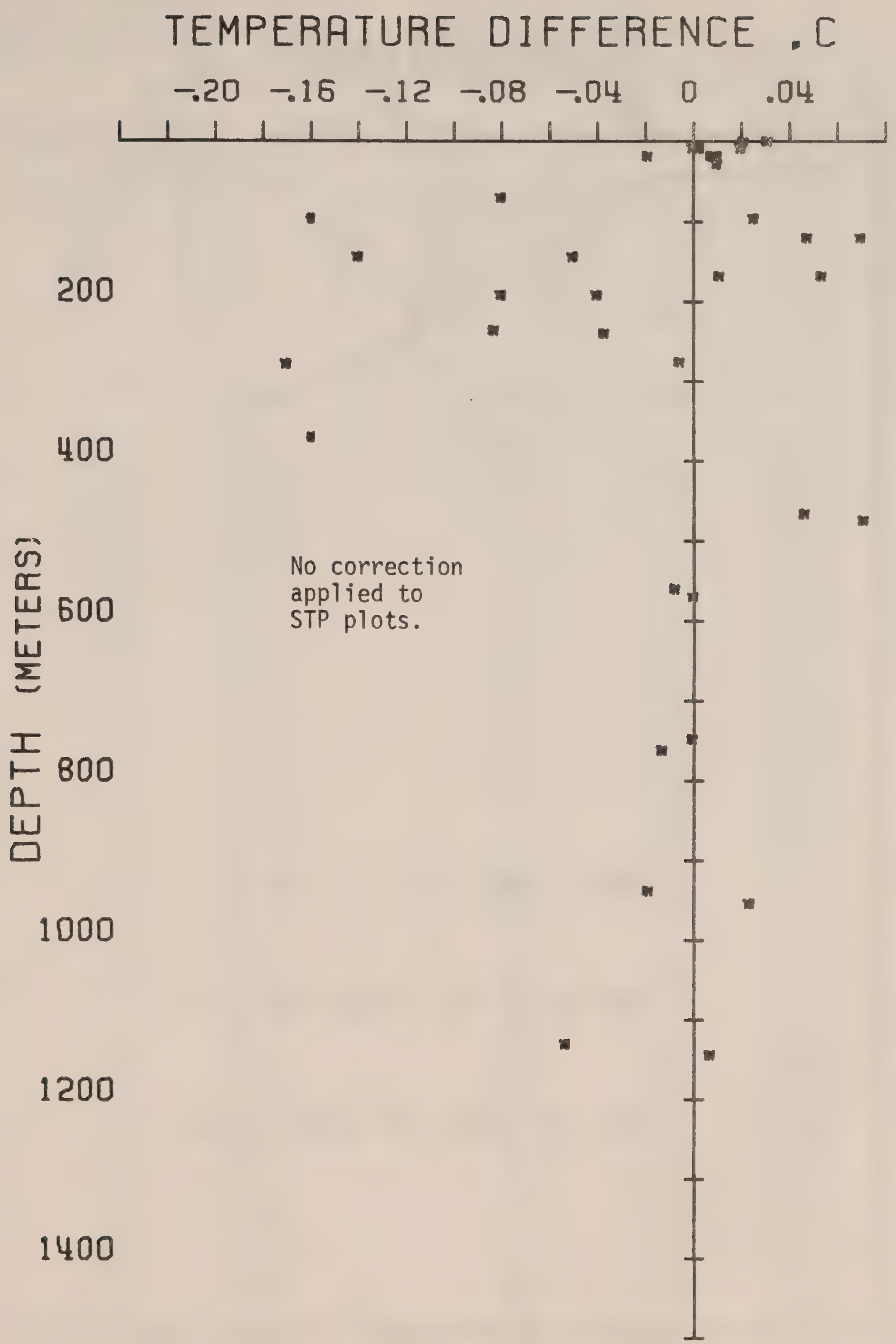
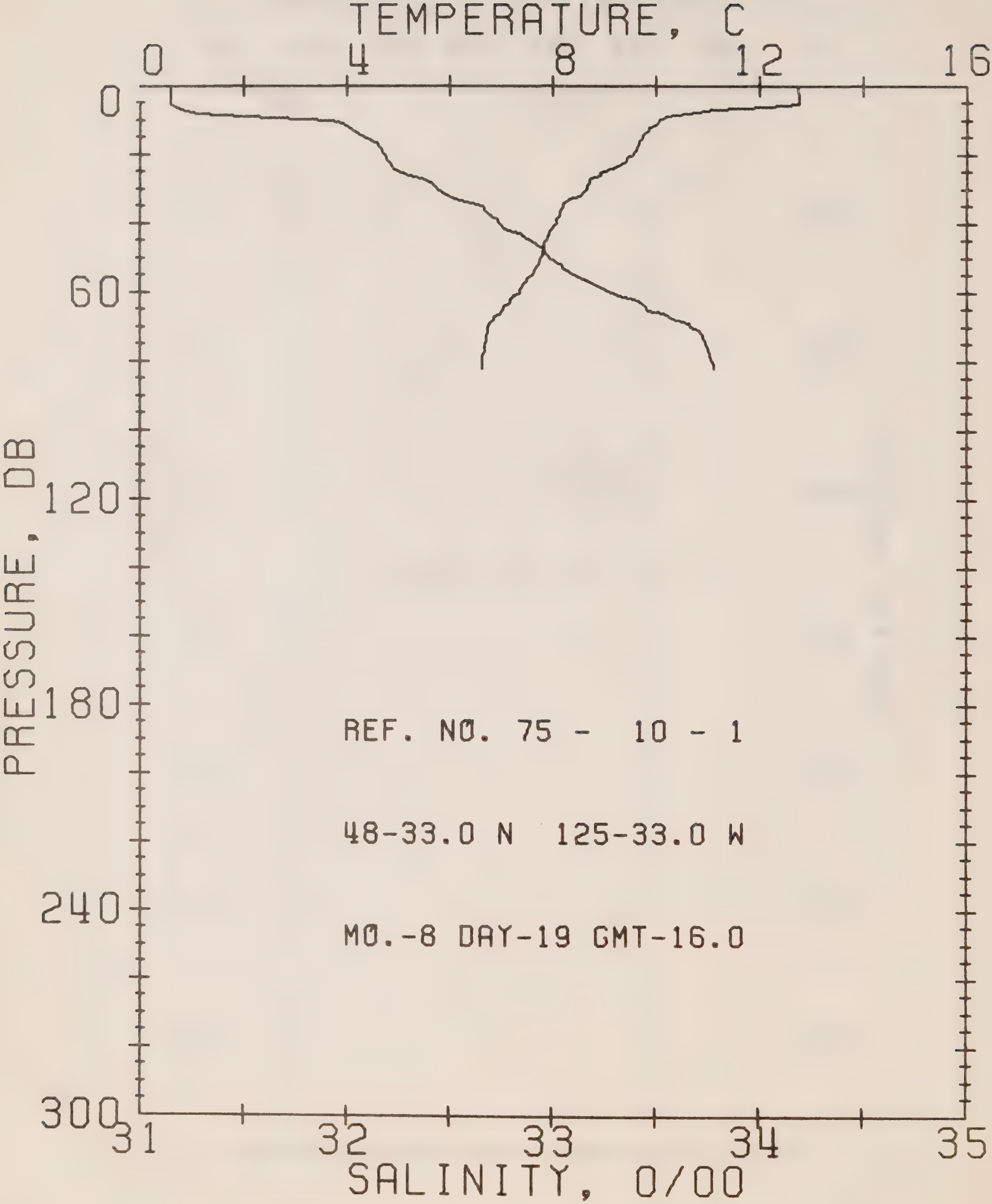


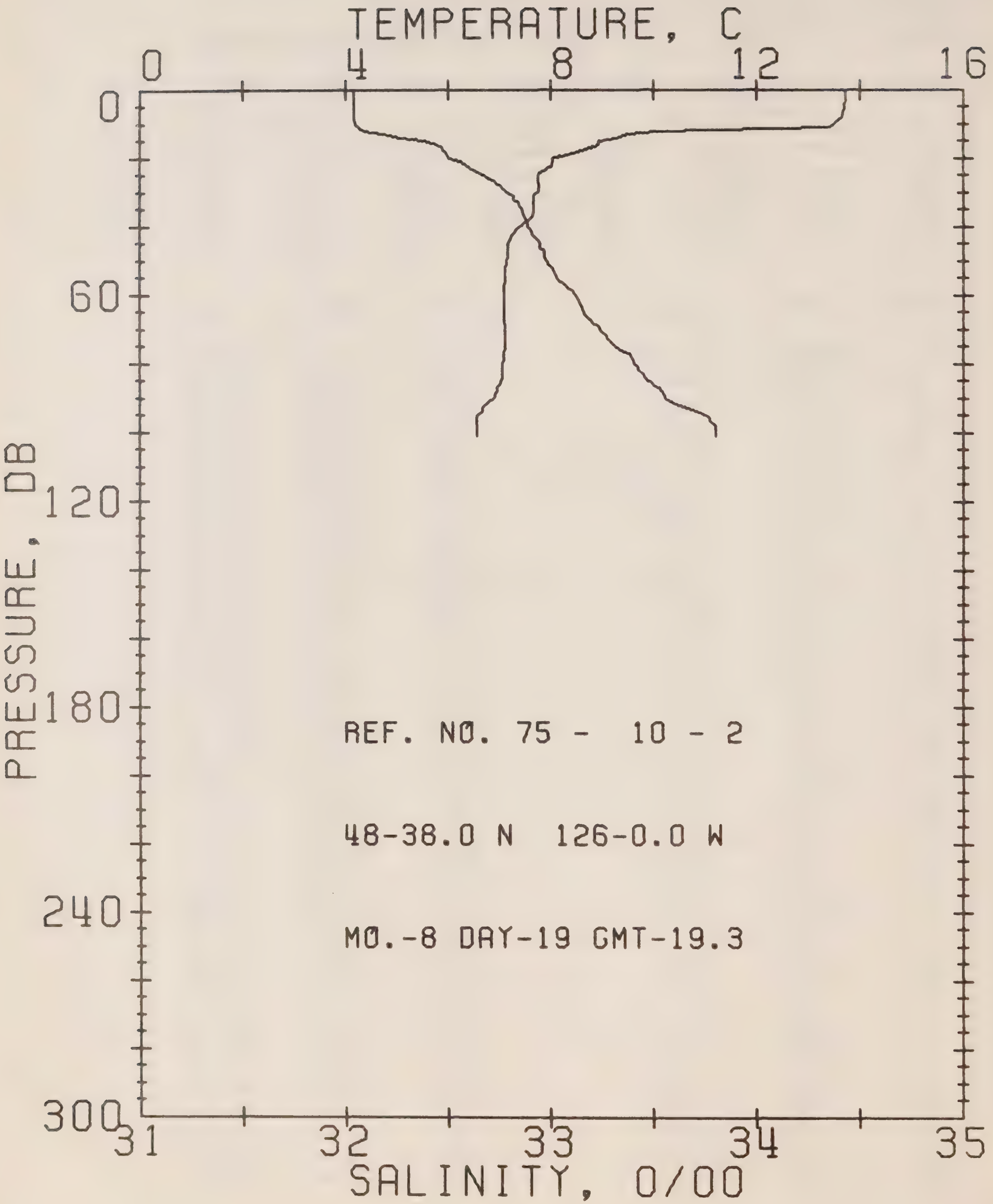
Fig. 3 Temperature difference between hydro data and STP.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 75 - 10 - 1
48-33.0 N 125-33.0 W
MO.-8 DAY-19 GMT-16.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 1 DATE 19/ 8/75
POSITION 48-33.0N, 125-33.0W GMT 16.0
RESULTS OF STP CAST 74 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.75	31.15	0	23.49	440.8	0.0	0.0	1495.
10	10.07	31.93	10	24.57	338.0	0.42	0.02	1487.
20	9.54	32.18	20	24.85	311.3	0.74	0.07	1485.
30	8.66	32.44	30	25.19	279.1	1.04	0.14	1483.
50	7.79	32.99	50	25.75	226.2	1.53	0.35	1480.
75	6.69	33.74	75	26.49	156.1	2.01	0.64	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	12.75	31.15	40.	8.07	32.74
2.	12.75	31.15	41.	8.02	32.75
3.	12.77	31.15	42.	7.98	32.78
4.	12.76	31.15	43.	7.95	32.84
5.	12.77	31.15	44.	7.91	32.87
6.	12.17	31.17	45.	7.88	32.90
7.	11.15	31.20	46.	7.84	32.92
8.	10.61	31.28	47.	7.83	32.95
9.	10.22	31.51	49.	7.81	32.97
10.	10.07	31.93	50.	7.79	32.99
11.	10.04	31.98	51.	7.76	33.01
12.	9.90	32.01	52.	7.73	33.04
13.	9.86	32.03	53.	7.69	33.05
14.	9.78	32.06	54.	7.66	33.08
15.	9.75	32.09	55.	7.60	33.10
16.	9.70	32.13	56.	7.53	33.15
17.	9.67	32.15	57.	7.49	33.18
18.	9.66	32.16	58.	7.42	33.22
19.	9.63	32.17	60.	7.37	33.29
20.	9.54	32.18	61.	7.24	33.32
21.	9.47	32.19	62.	7.19	33.40
22.	9.40	32.20	63.	7.16	33.43
24.	9.14	32.23	64.	7.07	33.45
25.	8.94	32.27	65.	7.04	33.46
26.	8.92	32.30	66.	6.99	33.54
27.	8.74	32.36	67.	6.87	33.56
28.	8.72	32.41	68.	6.85	33.60
30.	8.66	32.44	69.	6.79	33.66
31.	8.61	32.46	70.	6.76	33.67
32.	8.53	32.50	71.	6.74	33.71
33.	8.32	32.53	72.	6.74	33.72
34.	8.24	32.60	73.	6.71	33.73
35.	8.22	32.66	77.	6.68	33.75
36.	8.20	32.67	78.	6.66	33.76
37.	8.15	32.68	79.	6.64	33.76
38.	8.12	32.71	81.	6.64	33.78
39.	8.09	32.73	82.	6.64	33.78


TEMPERATURE, C
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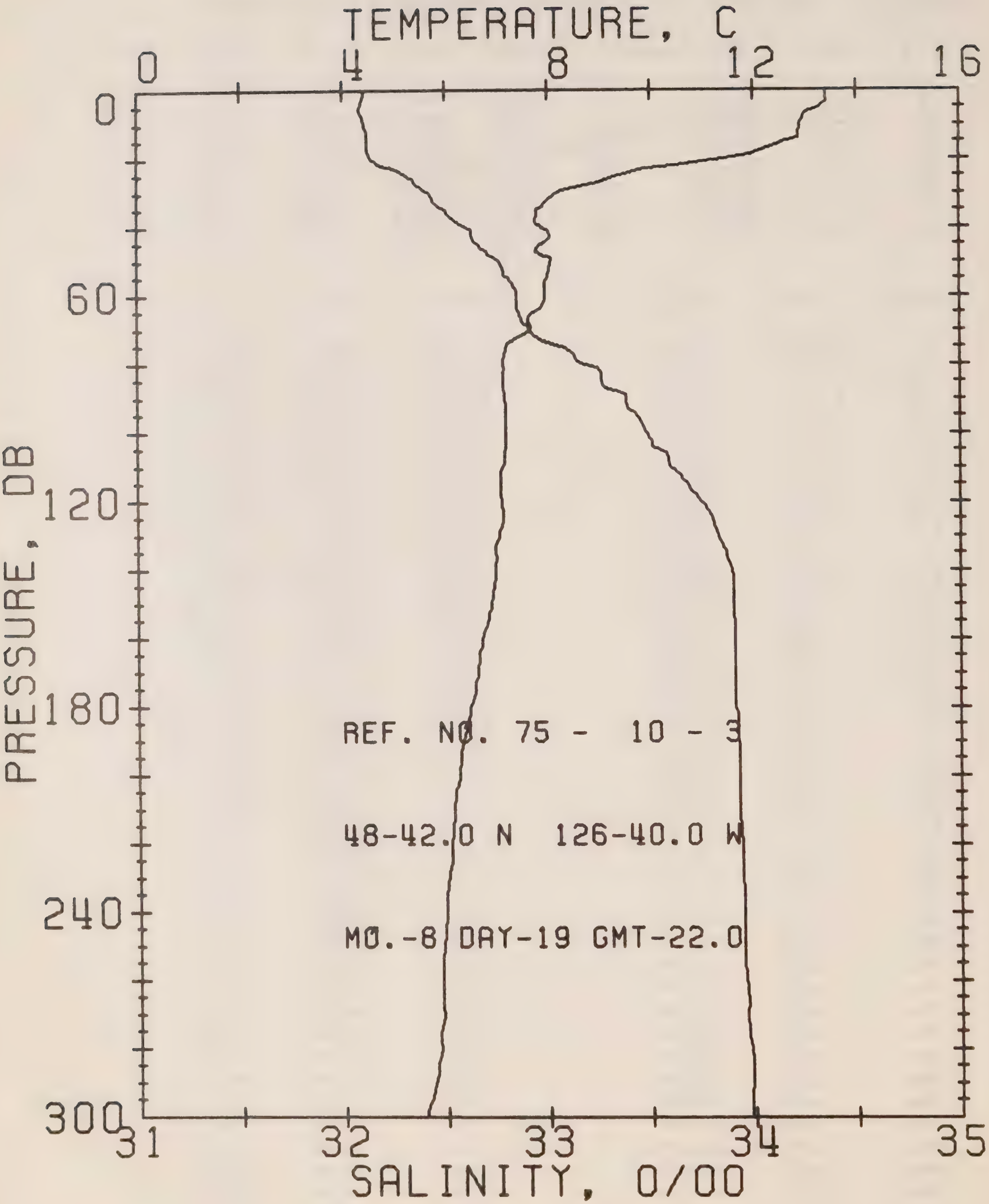
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 75 - 10 - 2
48-38.0 N 126-0.0 W
MO.-8 DAY-19 GMT-19.3
31
32
33
34
35
SALINITY, O/OO

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 2 DATE 19/ 8/75
POSITION 48-38.0N, 126- 0.0W GMT 19.3
RESULTS OF STP CAST 78 POINTS TAKEN FROM ANALOG TRACE

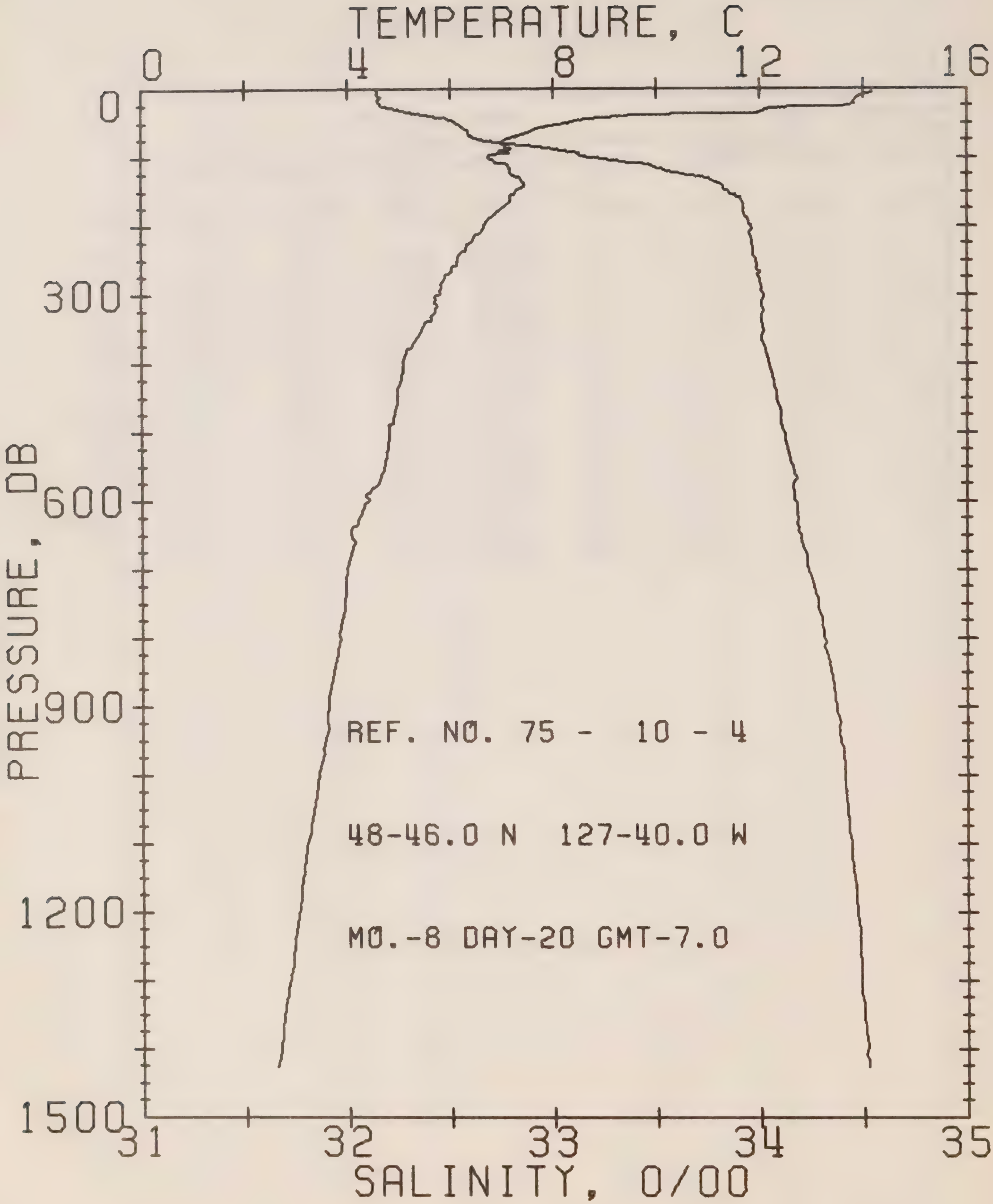
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.73	32.04	0	23.98	393.7	0.0	0.0	1500.
10	13.49	32.05	10	24.04	388.8	0.39	0.02	1499.
20	8.03	32.51	20	25.34	264.8	0.70	0.07	1480.
30	7.73	32.79	30	25.60	240.0	0.95	0.13	1479.
50	7.15	32.98	50	25.83	218.3	1.40	0.31	1478.
75	7.11	33.32	75	26.11	192.9	1.92	0.64	1479.
100	6.55	33.80	99	26.56	150.2	2.35	1.02	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	13.73	32.04	43.	7.26	32.92
2.	13.73	32.04	44.	7.20	32.94
3.	13.73	32.04	45.	7.18	32.95
5.	13.71	32.04	46.	7.17	32.95
6.	13.71	32.04	47.	7.16	32.97
7.	13.68	32.04	49.	7.16	32.97
8.	13.64	32.04	50.	7.15	32.98
9.	13.56	32.04	51.	7.14	32.99
10.	13.49	32.05	52.	7.13	33.01
11.	13.42	32.06	55.	7.13	33.03
12.	10.09	32.09	59.	7.09	33.11
13.	9.53	32.18	60.	7.09	33.12
14.	9.29	32.27	62.	7.09	33.14
15.	8.96	32.38	65.	7.10	33.16
16.	8.94	32.45	68.	7.10	33.21
17.	8.77	32.47	69.	7.12	33.23
18.	8.54	32.48	70.	7.12	33.24
20.	8.03	32.51	74.	7.12	33.30
21.	8.05	32.56	76.	7.11	33.34
22.	8.02	32.59	77.	7.10	33.38
23.	7.94	32.61	79.	7.09	33.40
24.	7.78	32.65	80.	7.08	33.41
25.	7.75	32.68	83.	7.07	33.45
26.	7.76	32.71	84.	7.06	33.46
27.	7.77	32.73	85.	7.05	33.49
28.	7.78	32.75	86.	7.00	33.50
29.	7.78	32.77	87.	6.95	33.53
30.	7.73	32.79	88.	6.95	33.54
31.	7.68	32.82	89.	6.93	33.55
32.	7.68	32.82	90.	6.89	33.56
33.	7.67	32.84	91.	6.79	33.58
34.	7.67	32.85	92.	6.72	33.63
35.	7.67	32.86	93.	6.69	33.67
36.	7.69	32.86	94.	6.63	33.73
37.	7.65	32.87	95.	6.57	33.76
38.	7.57	32.88	97.	6.56	33.78
40.	7.39	32.89	98.	6.55	33.80
41.	7.33	32.90	100.	6.55	33.80
42.	7.29	32.91	101.	6.55	[illegible]


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 75 - 10 - 3
48-42.0 N 126-40.0 W
MØ.-8 DAY-19 GMT-22.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 3 DATE 19/ 8/75
POSITION 48-42.0N, 126-40.0W GMT 22.0
RESULTS OF STP CAST 158 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	13.40	32.11	0	24.10	382.3	0.0	0.0	1499.
10	12.91	32.11	10	24.20	373.5	0.38	0.02	1497.
20	11.45	32.14	20	24.50	345.4	0.75	0.07	1492.
30	8.17	32.42	30	25.25	273.6	1.05	0.15	1481.
50	8.06	32.76	50	25.53	247.1	1.56	0.36	1481.
75	7.17	33.09	75	25.92	210.8	2.15	0.74	1478.
100	7.18	33.48	99	26.22	182.2	2.64	1.17	1479.
125	7.11	33.80	124	26.48	157.9	3.06	1.65	1480.
150	6.89	33.90	149	26.59	147.9	3.44	2.18	1480.
175	6.55	33.91	174	26.65	143.0	3.80	2.78	1479.
200	6.23	33.93	199	26.70	137.8	4.15	3.45	1478.
225	6.07	33.94	223	26.73	135.4	4.50	4.19	1478.
250	5.92	33.95	248	26.76	133.1	4.83	5.00	1477.
300	5.56	33.98	298	26.83	127.1	5.48	6.83	1477.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300
600
900
1200
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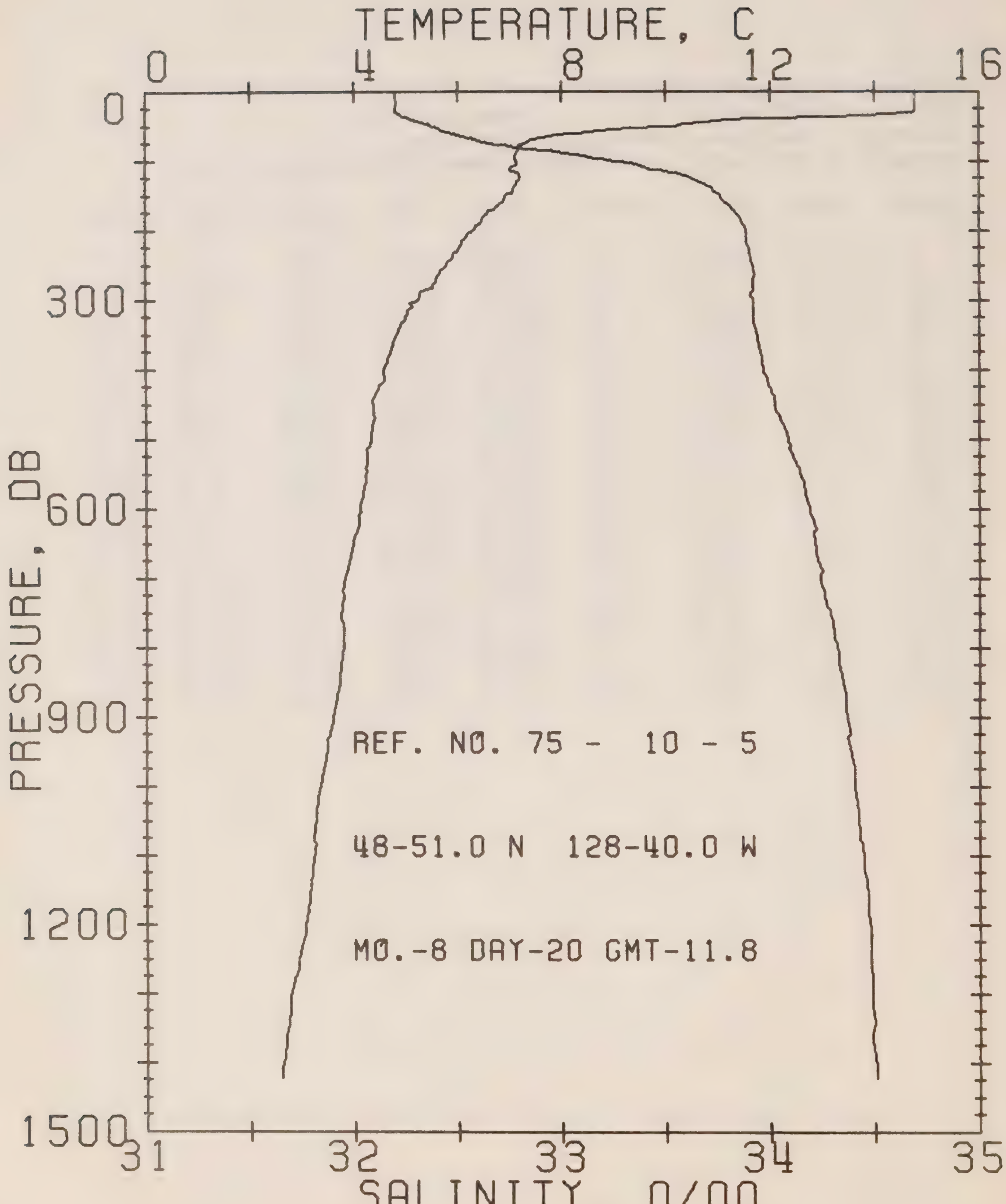
REF. NO. 75 - 10 - 4
48-46.0 N 127-40.0 W
MO.-8 DAY-20 GMT-7.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 4 DATE 20/ 8/75
POSITION 48-46.0N. 127-40.0W GMT 7.0
RESULTS OF STP CAST 268 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.17	32.14	0	23.97	394.9	0.0	0.0	1501.
10	13.98	32.15	10	24.02	390.9	0.39	0.02	1501.
20	13.84	32.16	20	24.05	387.7	0.78	0.08	1500.
30	12.13	32.24	30	24.45	350.2	1.15	0.17	1495.
50	8.20	32.53	50	25.33	266.5	1.75	0.42	1481.
75	7.04	32.67	75	25.60	240.4	2.39	0.82	1477.
100	6.73	33.19	99	26.05	198.1	2.93	1.30	1477.
125	7.21	33.65	124	26.35	170.5	3.39	1.82	1480.
150	7.27	33.85	149	26.50	156.7	3.80	2.39	1481.
175	6.97	33.92	174	26.60	147.8	4.17	3.02	1480.
200	6.65	33.96	199	26.67	141.0	4.53	3.71	1480.
225	6.35	33.96	223	26.71	137.5	4.88	4.46	1479.
250	6.12	33.98	248	26.76	133.3	5.22	5.28	1478.
300	5.78	34.01	298	26.82	127.5	5.87	7.10	1478.
400	5.07	34.04	397	26.94	117.5	7.10	11.49	1477.
500	4.79	34.12	496	27.02	109.8	8.24	16.70	1477.
600	4.37	34.17	595	27.11	102.0	9.30	22.64	1477.
800	3.82	34.31	793	27.28	86.9	11.17	35.95	1478.
1000	3.41	34.41	991	27.40	76.5	12.80	50.84	1480.
1200	3.01	34.47	1188	27.49	68.9	14.26	67.15	1482.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8
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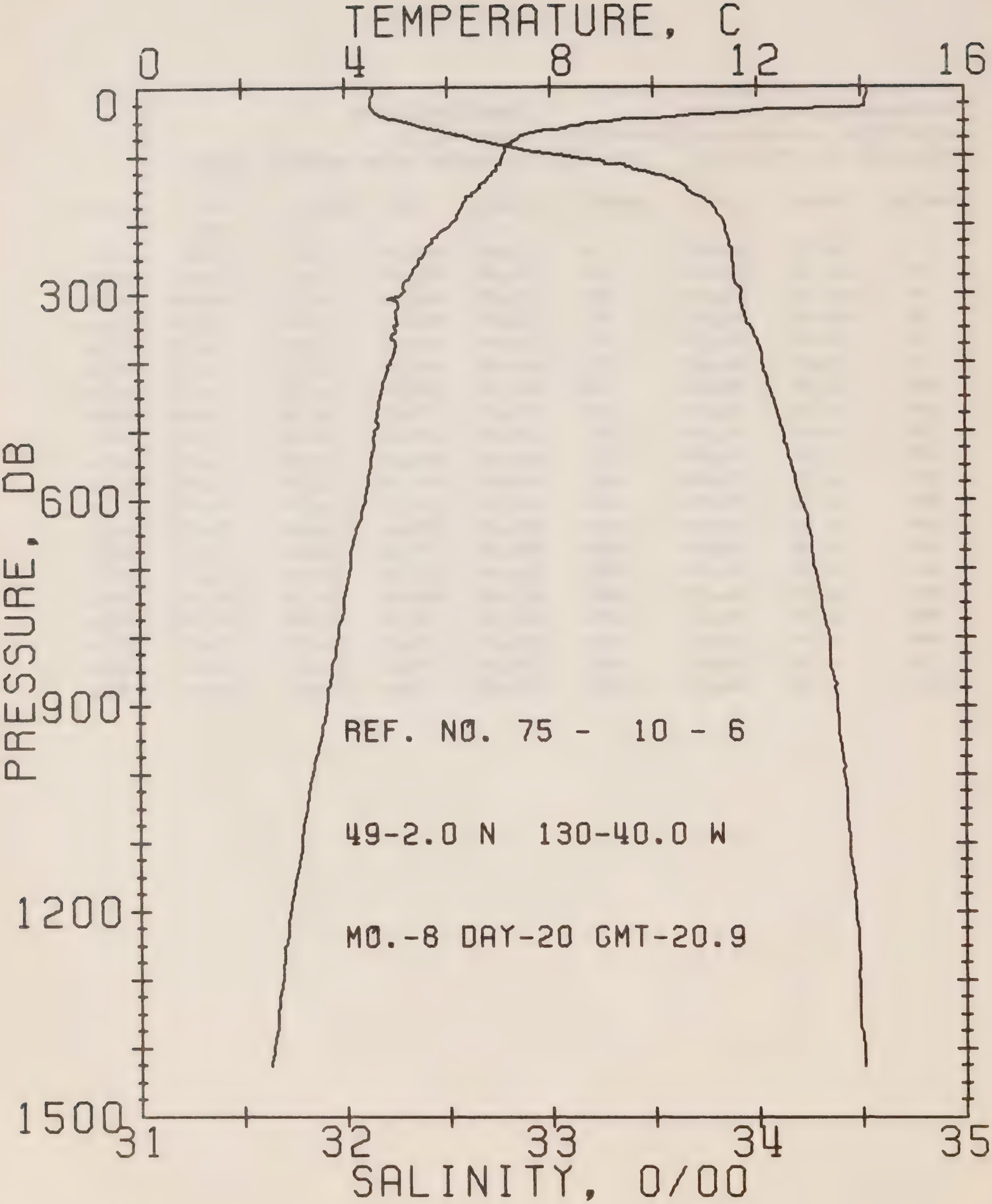
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 5
48-51.0 N 128-40.0 W
MO.-8 DAY-20 GMT-11.8
31
32
33
34
35
SALINITY, O/OO

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 5 DATE 20/ 8/75
POSITION 48-51.0N, 128-40.0W GMT 11.8
RESULTS OF STP CAST 257 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.76	32.20	0	23.89	402.4	0.0	0.0	1503.
10	14.76	32.20	10	23.89	402.9	0.40	0.02	1503.
20	14.76	32.21	20	23.90	402.3	0.81	0.08	1504.
30	14.65	32.21	30	23.92	400.4	1.21	0.18	1503.
50	10.02	32.39	50	24.94	303.8	1.89	0.46	1488.
75	7.23	32.69	75	25.59	241.4	2.56	0.88	1478.
100	7.14	33.29	99	26.08	195.9	3.10	1.36	1479.
125	7.18	33.63	124	26.34	171.5	3.55	1.88	1480.
150	6.91	33.76	149	26.48	158.3	3.96	2.46	1480.
175	6.56	33.84	174	26.59	148.5	4.35	3.09	1479.
200	6.26	33.89	199	26.67	141.2	4.71	3.79	1478.
225	6.01	33.90	223	26.71	137.7	5.06	4.54	1477.
250	5.76	33.92	248	26.75	133.4	5.40	5.36	1477.
300	5.22	33.92	298	26.82	127.5	6.05	7.19	1475.
400	4.55	33.97	397	26.93	117.1	7.27	11.54	1474.
500	4.32	34.09	496	27.05	106.5	8.39	16.65	1475.
600	4.11	34.19	595	27.16	97.6	9.41	22.36	1476.
800	3.77	34.32	793	27.29	85.7	11.23	35.32	1478.
1000	3.32	34.40	991	27.40	76.2	12.85	50.10	1480.
1200	3.05	34.48	1188	27.49	68.8	14.29	66.28	1482.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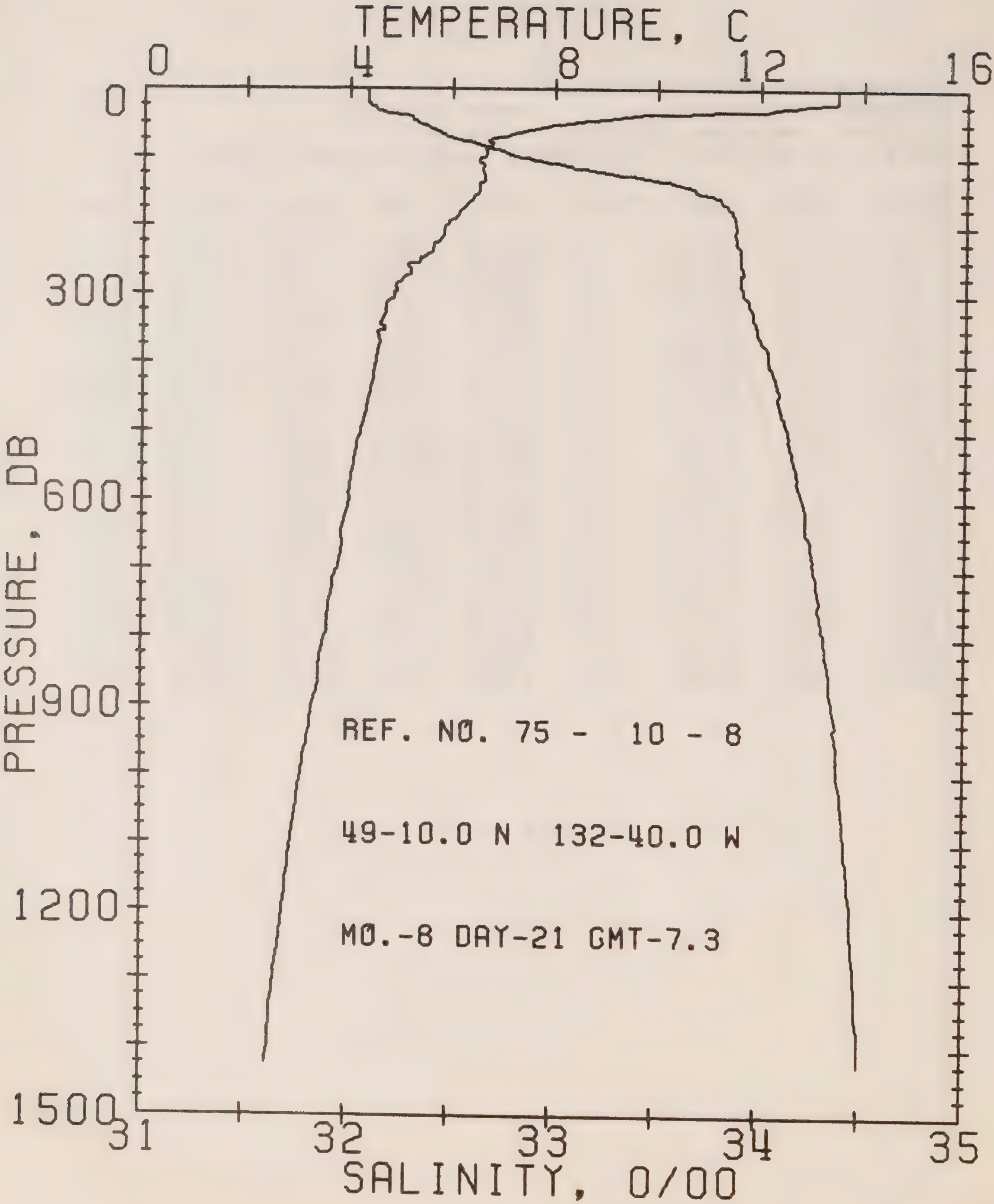
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 6
49-2.0 N 130-40.0 W
MO.-8 DAY-20 GMT-20.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 6 DATE 20/ 8/75
POSITION 49- 2.0N, 130-40.0W GMT 20.9
RESULTS OF STP CAST 281 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.13	32.14	0	23.98	394.2	0.0	0.0	1501.
10	14.11	32.14	10	23.98	394.2	0.39	0.02	1501.
20	14.09	32.14	20	23.99	394.1	0.79	0.08	1501.
30	13.43	32.14	30	24.12	381.6	1.18	0.18	1499.
50	9.17	32.30	50	25.00	297.4	1.85	0.45	1485.
75	7.35	32.63	75	25.53	247.2	2.52	0.88	1479.
100	7.08	33.09	99	25.93	210.0	3.09	1.39	1478.
125	6.88	33.51	124	26.29	176.4	3.57	1.93	1479.
150	6.59	33.67	149	26.45	161.1	3.99	2.52	1478.
175	6.26	33.79	174	26.59	148.1	4.38	3.15	1477.
200	6.03	33.84	199	26.66	141.9	4.74	3.85	1477.
225	5.70	33.87	223	26.72	136.3	5.09	4.60	1476.
250	5.45	33.88	248	26.76	132.6	5.42	5.41	1475.
300	5.12	33.93	298	26.84	125.5	6.07	7.22	1475.
400	4.88	34.02	397	26.94	117.1	7.28	11.55	1476.
500	4.55	34.12	496	27.05	106.9	8.40	16.66	1476.
600	4.36	34.21	595	27.15	98.9	9.43	22.44	1477.
800	3.82	34.35	793	27.31	84.5	11.26	35.42	1478.
1000	3.32	34.41	991	27.41	75.2	12.86	50.07	1480.
1200	2.89	34.47	1188	27.50	67.5	14.28	66.04	1481.


TEMPERATURE, C
0
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300
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1200
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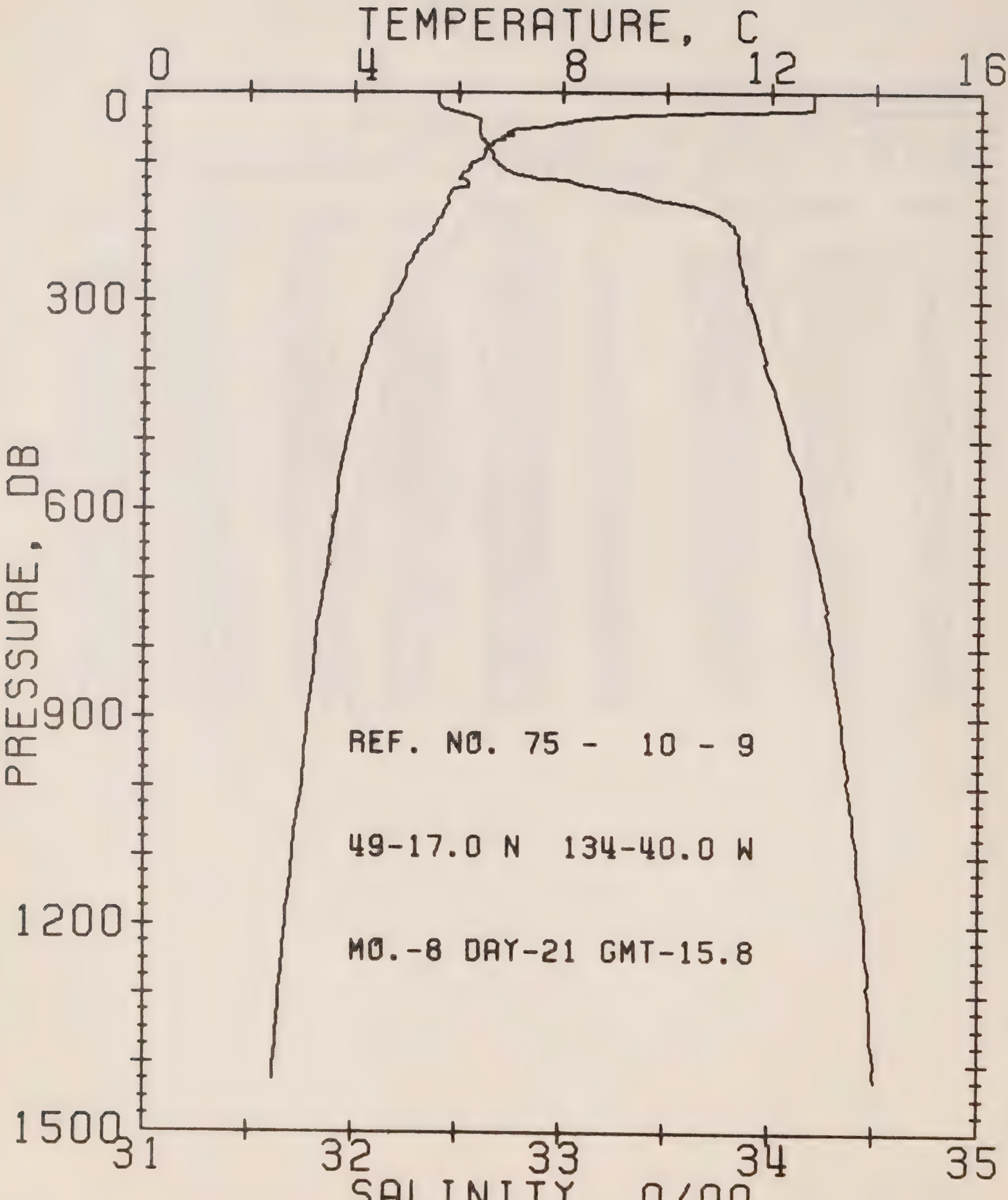
PRESSURE, DB
REF. NO. 75 - 10 - 8
49-10.0 N 132-40.0 W
MO.-8 DAY-21 GMT-7.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 8 DATE 21/ 8/75
POSITION 49-10.0N, 132-40.0W GMT 7.3
RESULTS OF STP CAST 307 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.49	32.08	0	24.06	386.2	0.0	0.0	1499.
10	13.49	32.09	10	24.07	385.9	0.39	0.02	1499.
20	13.22	32.09	20	24.12	381.0	0.77	0.08	1498.
30	12.20	32.13	30	24.35	359.5	1.14	0.17	1495.
50	8.20	32.34	50	25.19	279.9	1.76	0.42	1481.
75	6.73	32.56	75	25.56	244.7	2.41	0.84	1476.
100	6.56	32.86	99	25.82	220.5	2.99	1.35	1476.
125	6.63	33.33	124	26.18	186.6	3.50	1.94	1477.
150	6.52	33.69	149	26.48	158.6	3.93	2.53	1478.
175	6.19	33.86	174	26.65	142.2	4.30	3.14	1477.
200	5.88	33.89	199	26.72	136.4	4.65	3.81	1476.
225	5.67	33.89	223	26.74	134.3	4.99	4.54	1476.
250	5.39	33.91	248	26.79	129.6	5.31	5.34	1475.
300	4.88	33.92	298	26.86	123.5	5.94	7.10	1474.
400	4.52	34.05	397	27.00	110.9	7.10	11.23	1474.
500	4.23	34.14	496	27.10	101.8	8.17	16.10	1475.
600	4.00	34.22	595	27.19	94.5	9.15	21.60	1476.
800	3.53	34.32	793	27.32	83.0	10.92	34.22	1477.
1000	3.10	34.39	990	27.41	74.5	12.49	48.59	1479.
1200	2.76	34.46	1188	27.50	66.8	13.90	64.35	1481.


TEMPERATURE, C
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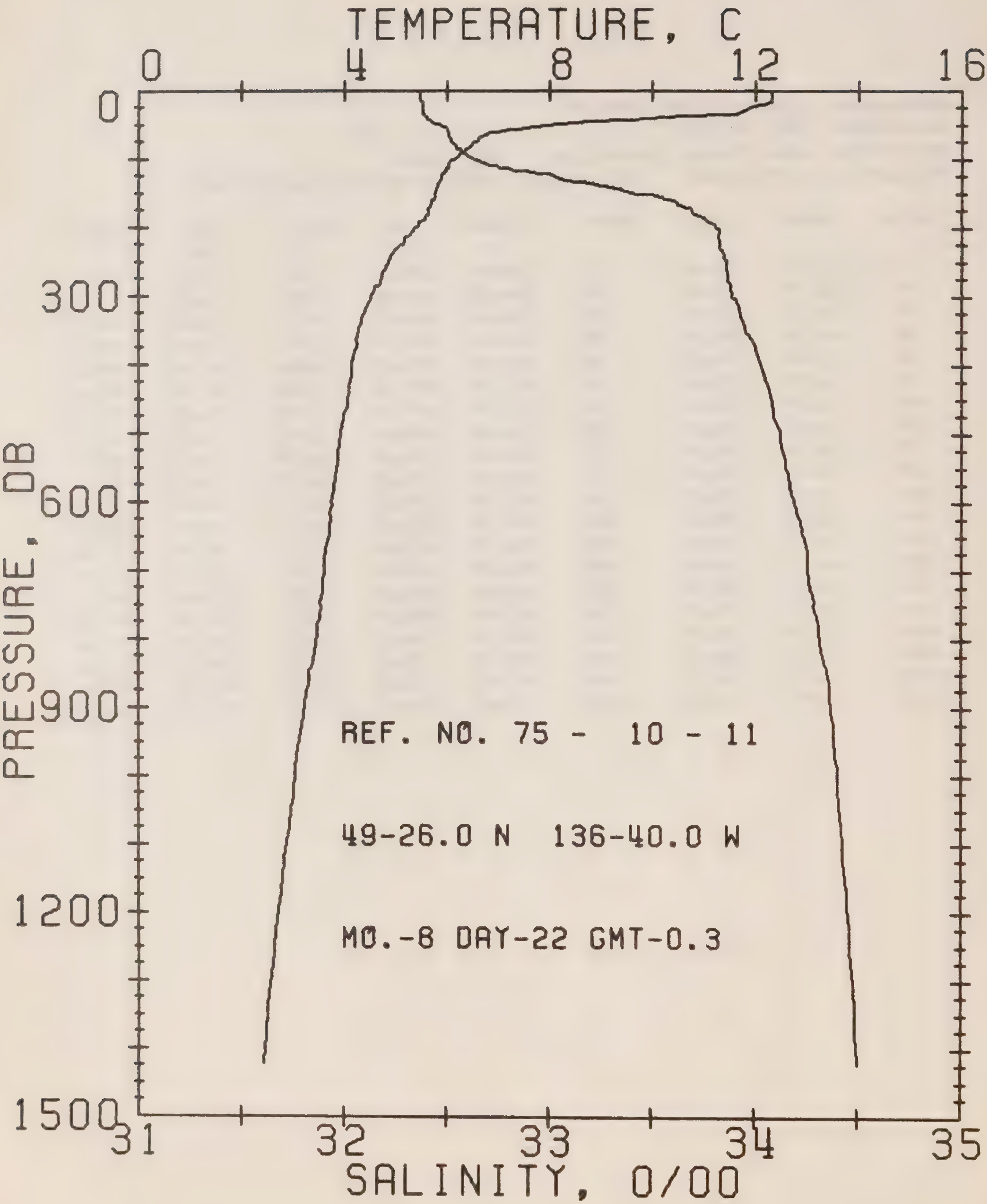
PRESSURE, DB
REF. NO. 75 - 10 - 9
49-17.0 N 134-40.0 W
MO.-8 DAY-21 GMT-15.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 9 DATE 21/ 8/75
POSITION 49-17.0N. 134-40.0W GMT 15.8
RESULTS OF STP CAST 270 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.79	32.40	0	24.45	349.5	0.0	0.0	1497.
10	12.79	32.40	10	24.45	349.9	0.35	0.02	1497.
20	12.79	32.41	20	24.46	349.2	0.70	0.07	1497.
30	10.16	32.52	30	25.01	296.0	1.03	0.16	1488.
50	7.63	32.60	50	25.47	253.1	1.56	0.37	1479.
75	6.61	32.64	75	25.64	237.2	2.17	0.76	1476.
100	6.27	32.68	99	25.72	230.0	2.76	1.28	1475.
125	6.15	33.02	124	26.00	203.7	3.31	1.92	1475.
150	5.79	33.41	149	26.35	170.6	3.78	2.57	1475.
175	5.68	33.74	174	26.62	145.1	4.17	3.22	1475.
200	5.50	33.83	199	26.71	136.3	4.52	3.89	1475.
225	5.21	33.84	223	26.76	132.5	4.86	4.61	1474.
250	5.01	33.85	248	26.79	129.6	5.18	5.40	1474.
300	4.71	33.89	298	26.85	123.9	5.82	7.18	1473.
400	4.15	33.98	397	26.98	112.1	6.99	11.34	1473.
500	3.86	34.09	496	27.10	101.7	8.05	16.22	1473.
600	3.66	34.17	595	27.19	94.1	9.03	21.67	1474.
800	3.28	34.30	793	27.33	81.5	10.77	34.10	1476.
1000	3.02	34.37	990	27.41	74.8	12.34	48.39	1478.
1200	2.71	34.46	1188	27.50	66.2	13.74	64.14	1480.


TEMPERATURE, C
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PRESSURE, DB
REF. NO. 75 - 10 - 11
49-26.0 N 136-40.0 W
MO.-8 DAY-22 GMT-0.3
31
32
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34
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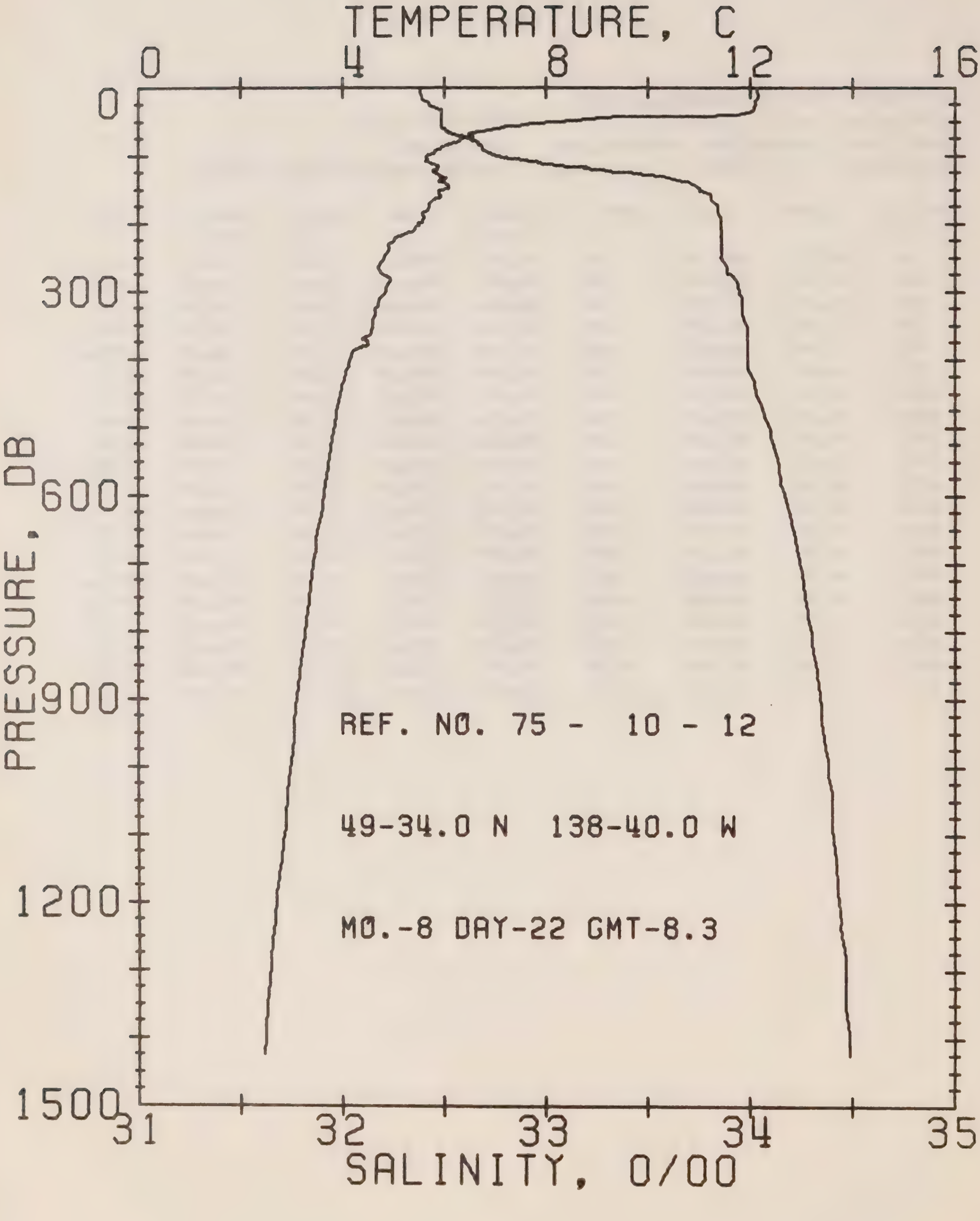
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 11 DATE 22/ 8/75
POSITION 49-26.0N. 136-40.0W GMT 0.3
RESULTS OF STP CAST 244 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.32	32.37	0	24.51	343.1	0.0	0.0	1495.
10	12.32	32.37	10	24.51	343.6	0.34	0.02	1495.
20	12.13	32.38	20	24.56	339.6	0.69	0.07	1495.
30	11.76	32.38	30	24.62	333.2	1.02	0.16	1494.
50	7.98	32.47	50	25.32	267.5	1.62	0.40	1480.
75	6.52	32.53	75	25.56	244.5	2.25	0.80	1475.
100	6.14	32.64	99	25.70	231.7	2.84	1.33	1474.
125	5.89	33.03	124	26.04	199.5	3.39	1.95	1474.
150	5.76	33.42	149	26.36	169.5	3.84	2.59	1474.
175	5.63	33.69	174	26.59	147.8	4.23	3.23	1475.
200	5.36	33.82	199	26.72	135.4	4.59	3.90	1474.
225	5.07	33.83	223	26.77	131.6	4.92	4.63	1473.
250	4.84	33.86	248	26.81	127.0	5.24	5.41	1473.
300	4.52	33.89	298	26.87	121.7	5.86	7.15	1472.
400	4.14	34.02	397	27.02	108.4	7.01	11.22	1473.
500	3.92	34.12	496	27.12	99.8	8.05	15.98	1473.
600	3.75	34.19	595	27.19	93.7	9.02	21.41	1475.
800	3.45	34.31	793	27.32	82.6	10.77	33.88	1477.
1000	3.03	34.40	990	27.43	73.0	12.31	47.99	1478.
1200	2.72	34.45	1188	27.50	66.9	13.71	63.65	1480.


TEMPERATURE, C
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300
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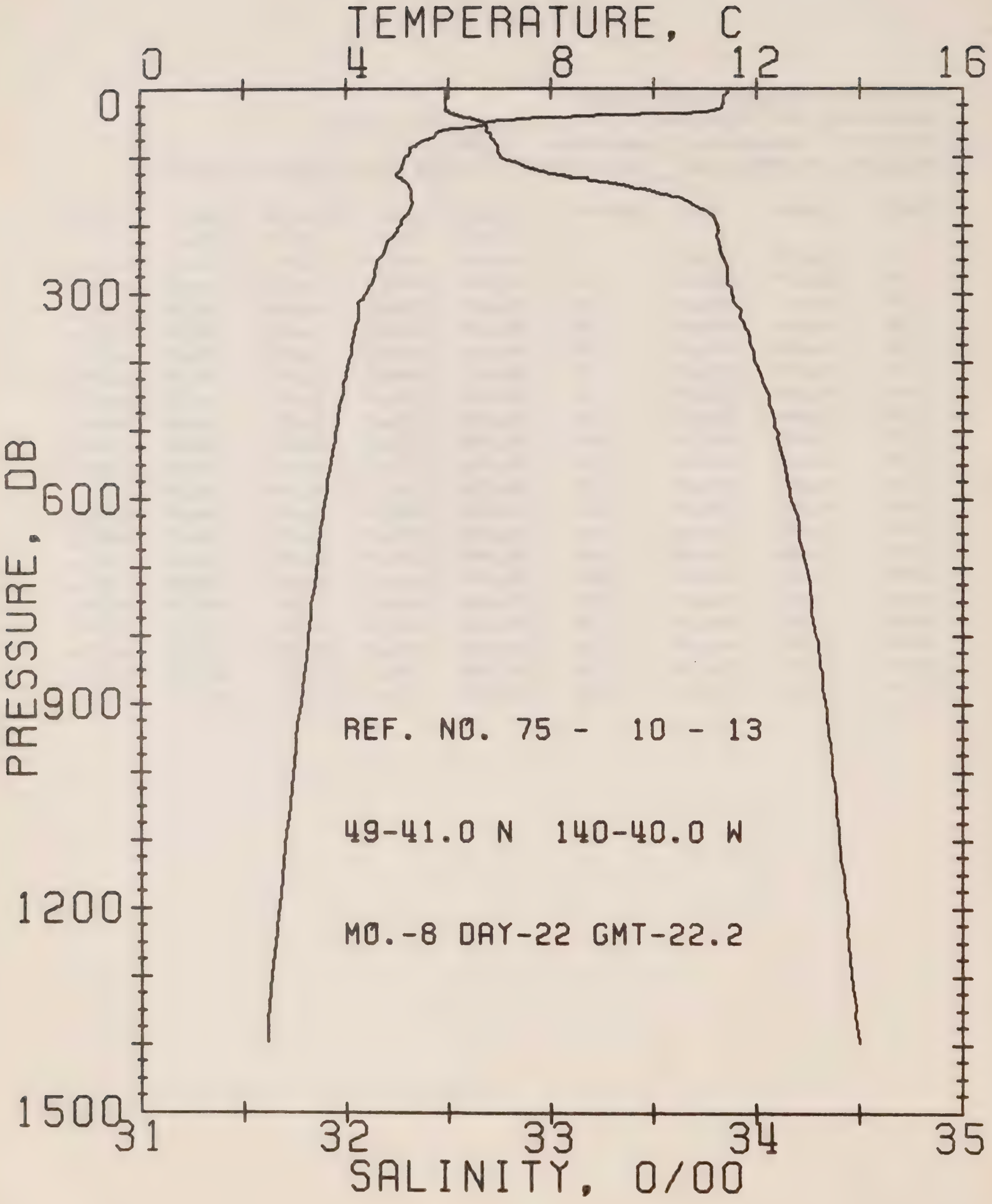
PRESSURE, DB
REF. NO. 75 - 10 - 12
49-34.0 N 138-40.0 W
MO.-8 DAY-22 GMT-8.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 12 DATE 22/ 8/75
POSITION 49-34.0N. 138-40.0W GMT 8.3
RESULTS OF STP CAST 226 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.13	32.38	0	24.56	338.9	0.0	0.0	1495.
10	12.15	32.38	10	24.56	339.5	0.34	0.02	1495.
20	12.10	32.41	20	24.59	336.7	0.68	0.07	1495.
30	12.08	32.47	30	24.64	332.3	1.01	0.15	1495.
50	8.12	32.49	50	25.31	268.0	1.63	0.40	1481.
75	6.30	32.63	75	25.67	234.1	2.25	0.80	1474.
100	5.62	32.76	99	25.86	216.6	2.81	1.30	1472.
125	5.84	33.44	124	26.37	168.6	3.30	1.86	1474.
150	5.93	33.75	149	26.60	146.9	3.69	2.40	1476.
175	5.69	33.84	174	26.70	137.5	4.04	2.98	1475.
200	5.50	33.86	199	26.74	134.1	4.38	3.63	1475.
225	5.05	33.85	223	26.78	129.9	4.71	4.35	1473.
250	4.82	33.86	248	26.82	126.9	5.03	5.13	1473.
300	4.84	33.95	298	26.89	120.8	5.65	6.86	1474.
400	4.13	33.99	397	26.99	111.0	6.81	10.99	1473.
500	3.82	34.09	496	27.11	100.6	7.87	15.84	1473.
600	3.62	34.17	595	27.19	93.8	8.85	21.29	1474.
800	3.25	34.30	793	27.33	81.7	10.59	33.69	1476.
1000	2.96	34.38	990	27.42	73.7	12.14	47.88	1478.
1200	2.68	34.44	1188	27.49	67.6	13.55	63.74	1480.


TEMPERATURE, C
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300
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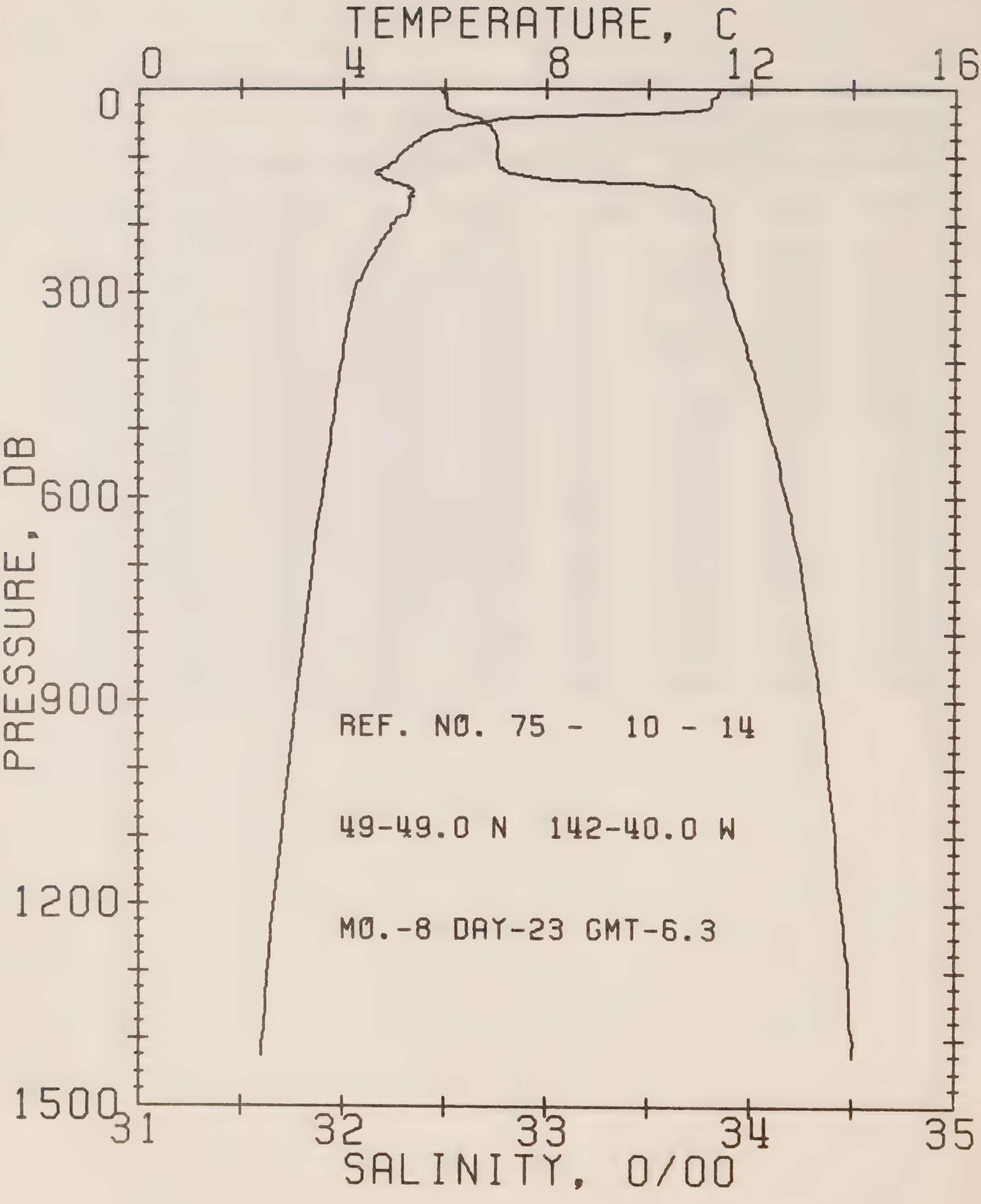
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 13
49-41.0 N 140-40.0 W
MO.-8 DAY-22 GMT-22.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 13 DATE 22/ 8/75
POSITION 49-41.0N, 140-40.0W GMT 22.2
RESULTS OF STP CAST 217 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.45	32.49	0	24.77	318.9	0.0	0.0	1492.
10	11.36	32.49	10	24.78	317.8	0.32	0.02	1492.
20	11.35	32.49	20	24.78	317.9	0.64	0.06	1492.
30	11.26	32.49	30	24.80	316.5	0.95	0.15	1492.
50	6.74	32.68	50	25.65	235.5	1.50	0.36	1476.
75	5.53	32.72	75	25.83	218.3	2.06	0.72	1471.
100	5.15	32.76	99	25.91	211.5	2.60	1.20	1470.
125	4.98	33.02	124	26.13	190.3	3.10	1.78	1470.
150	5.27	33.51	149	26.49	157.2	3.53	2.38	1473.
175	5.24	33.74	174	26.67	139.8	3.90	2.99	1473.
200	5.06	33.82	199	26.76	132.0	4.24	3.64	1473.
225	4.79	33.82	223	26.79	129.2	4.57	4.35	1472.
250	4.62	33.84	248	26.83	125.9	4.89	5.12	1472.
300	4.36	33.88	298	26.88	120.8	5.50	6.85	1472.
400	4.05	33.99	397	27.01	109.8	6.65	10.92	1472.
500	3.80	34.10	496	27.12	100.1	7.69	15.70	1473.
600	3.59	34.17	595	27.19	93.5	8.66	21.12	1474.
800	3.26	34.29	793	27.32	82.4	10.40	33.51	1476.
1000	2.96	34.37	990	27.41	74.4	11.96	47.81	1478.
1200	2.68	34.44	1188	27.49	67.2	13.38	63.68	1480.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600
900
1200
1500
PRESSURE, DB
31
32
33
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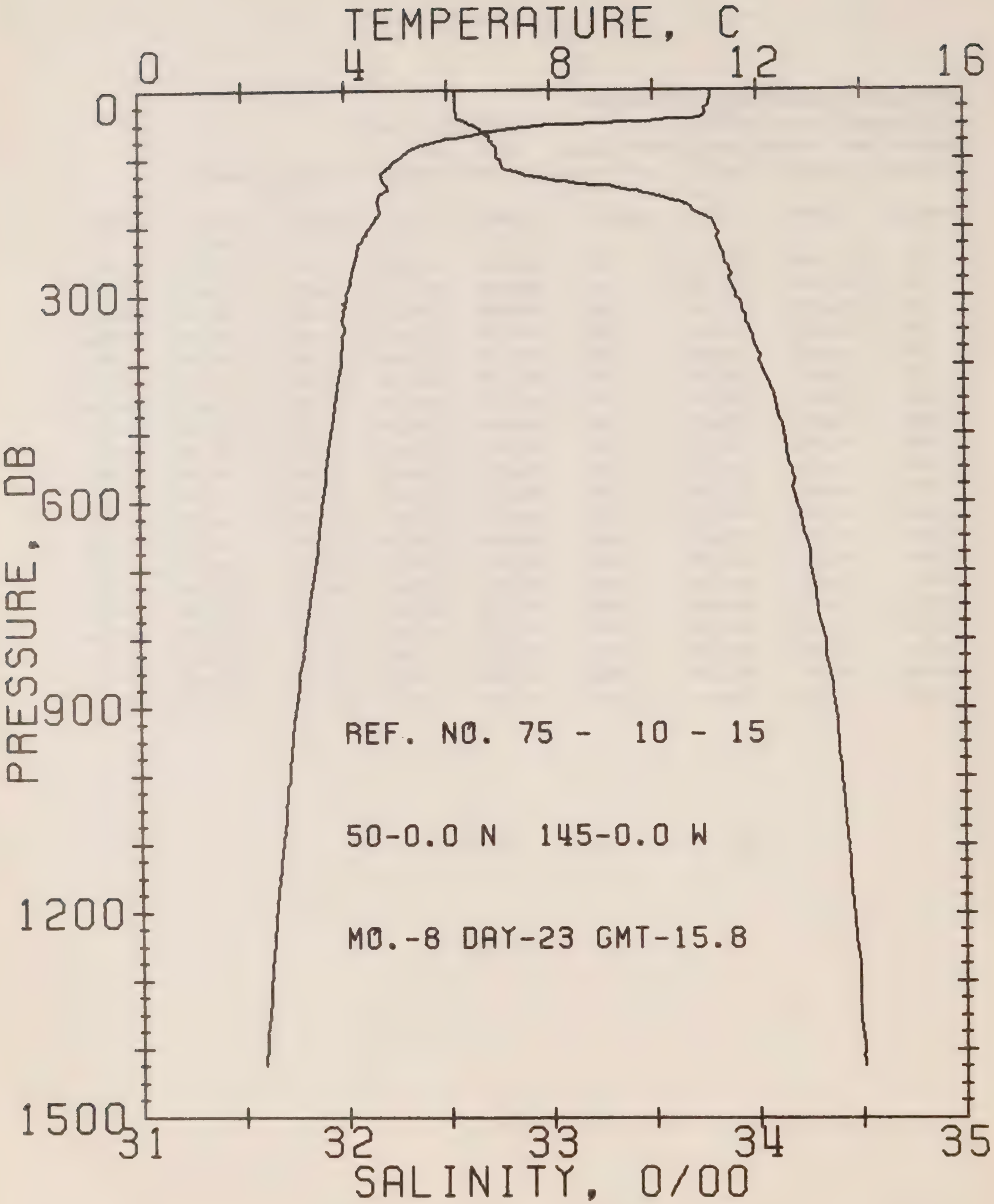
35
SALINITY, 0/00
REF. NØ. 75 - 10 - 14
49-49.0 N 142-40.0 W
MØ.-8 DAY-23 GMT-6.3

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 14 DATE 23/ 8/75
POSITION 49-49.0N, 142-40.0W GMT 6.3
RESULTS OF STP CAST 212 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.38	32.47	0	24.76	319.2	0.0	0.0	1492.
10	11.35	32.51	10	24.80	316.2	0.32	0.02	1492.
20	11.22	32.51	20	24.82	314.2	0.63	0.06	1492.
30	11.12	32.52	30	24.85	311.9	0.95	0.14	1492.
50	6.61	32.70	50	25.69	232.4	1.47	0.36	1475.
75	5.49	32.75	75	25.86	215.6	2.03	0.71	1471.
100	5.08	32.75	99	25.91	211.3	2.56	1.18	1470.
125	4.66	32.86	124	26.04	198.9	3.08	1.78	1469.
150	5.36	33.72	149	26.65	142.1	3.50	2.36	1473.
175	5.30	33.82	174	26.73	134.4	3.84	2.93	1474.
200	4.94	33.83	199	26.78	129.9	4.17	3.56	1472.
225	4.72	33.83	223	26.81	127.4	4.50	4.26	1472.
250	4.55	33.85	248	26.84	124.6	4.81	5.03	1472.
300	4.21	33.89	298	26.91	118.4	5.42	6.73	1471.
400	3.96	34.00	397	27.02	108.4	6.55	10.76	1472.
500	3.77	34.09	496	27.11	100.3	7.60	15.54	1473.
600	3.59	34.18	595	27.20	93.0	8.56	20.94	1474.
800	3.24	34.29	793	27.32	81.8	10.30	33.29	1476.
1000	2.93	34.38	990	27.42	73.5	11.84	47.40	1478.
1200	2.65	34.45	1188	27.50	66.6	13.24	63.07	1480.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12
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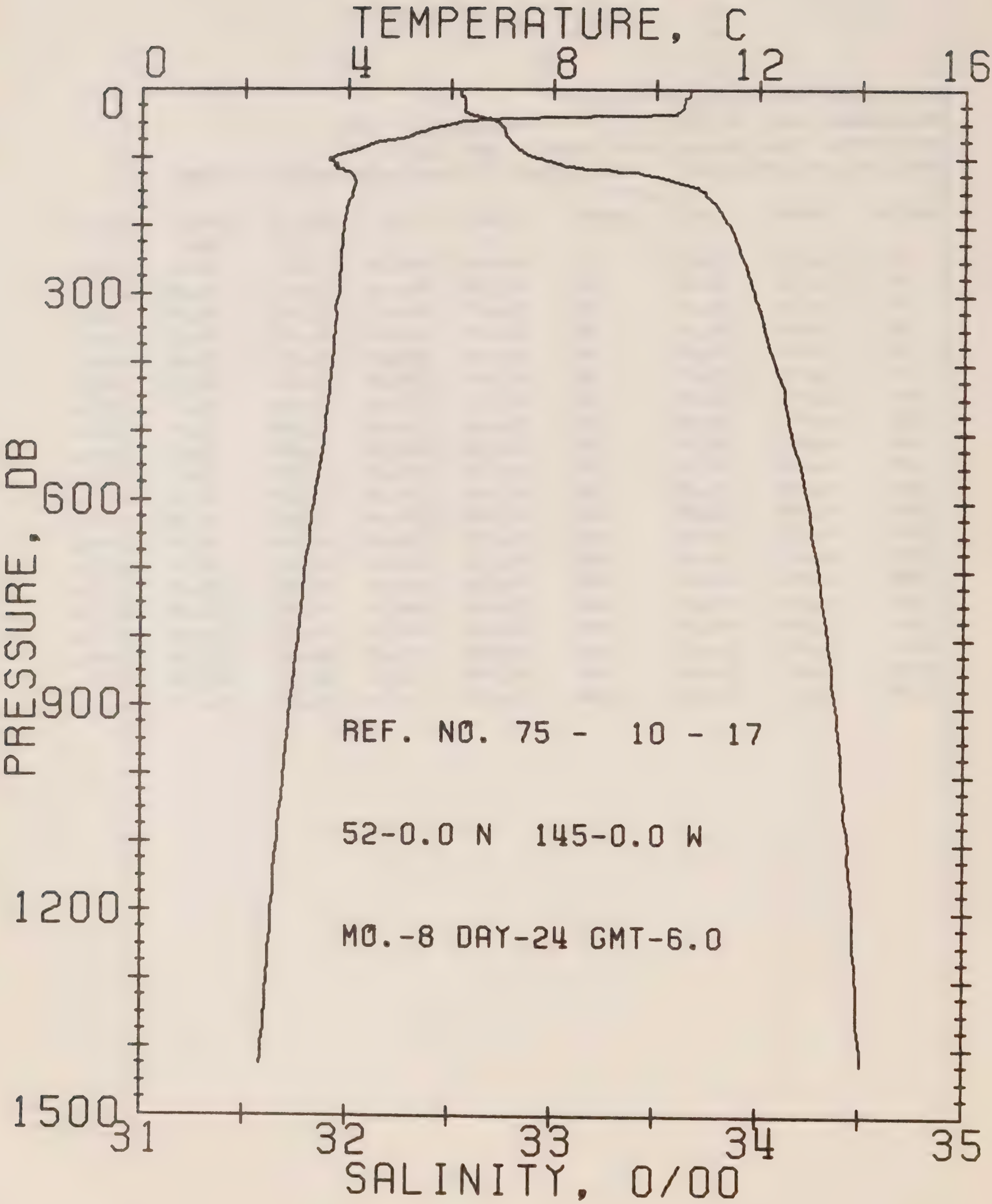
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 15
50-0.0 N 145-0.0 W
MO.-8 DAY-23 GMT-15.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 15 DATE 23/ 8/75
POSITION 50- 0.0N, 145- 0.0W GMT 15.8
RESULTS OF STP CAST 202 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.13	32.53	0	24.86	310.5	0.0	0.0	1491.
10	11.12	32.54	10	24.86	310.0	0.31	0.02	1491.
20	11.07	32.54	20	24.87	309.5	0.62	0.06	1491.
30	11.00	32.54	30	24.89	308.4	0.93	0.14	1491.
50	7.96	32.63	50	25.44	255.4	1.52	0.38	1480.
75	5.74	32.72	75	25.81	220.8	2.11	0.75	1472.
100	5.06	32.75	99	25.91	211.1	2.64	1.23	1470.
125	4.71	32.95	124	26.11	192.6	3.16	1.82	1469.
150	4.71	33.47	149	26.52	153.9	3.59	2.43	1470.
175	4.68	33.70	174	26.70	136.8	3.95	3.01	1471.
200	4.48	33.80	199	26.81	126.9	4.27	3.64	1471.
225	4.27	33.82	223	26.85	123.6	4.59	4.32	1471.
250	4.19	33.85	248	26.88	120.8	4.89	5.06	1470.
300	4.03	33.90	298	26.93	115.8	5.48	6.71	1470.
400	3.91	34.02	397	27.04	106.6	6.59	10.64	1472.
500	3.70	34.13	496	27.15	96.7	7.60	15.28	1473.
600	3.52	34.19	595	27.21	91.3	8.54	20.54	1474.
800	3.17	34.33	793	27.36	78.8	10.24	32.64	1476.
1000	2.88	34.40	990	27.44	71.3	11.73	46.29	1478.
1200	2.61	34.46	1188	27.51	65.3	13.09	61.53	1480.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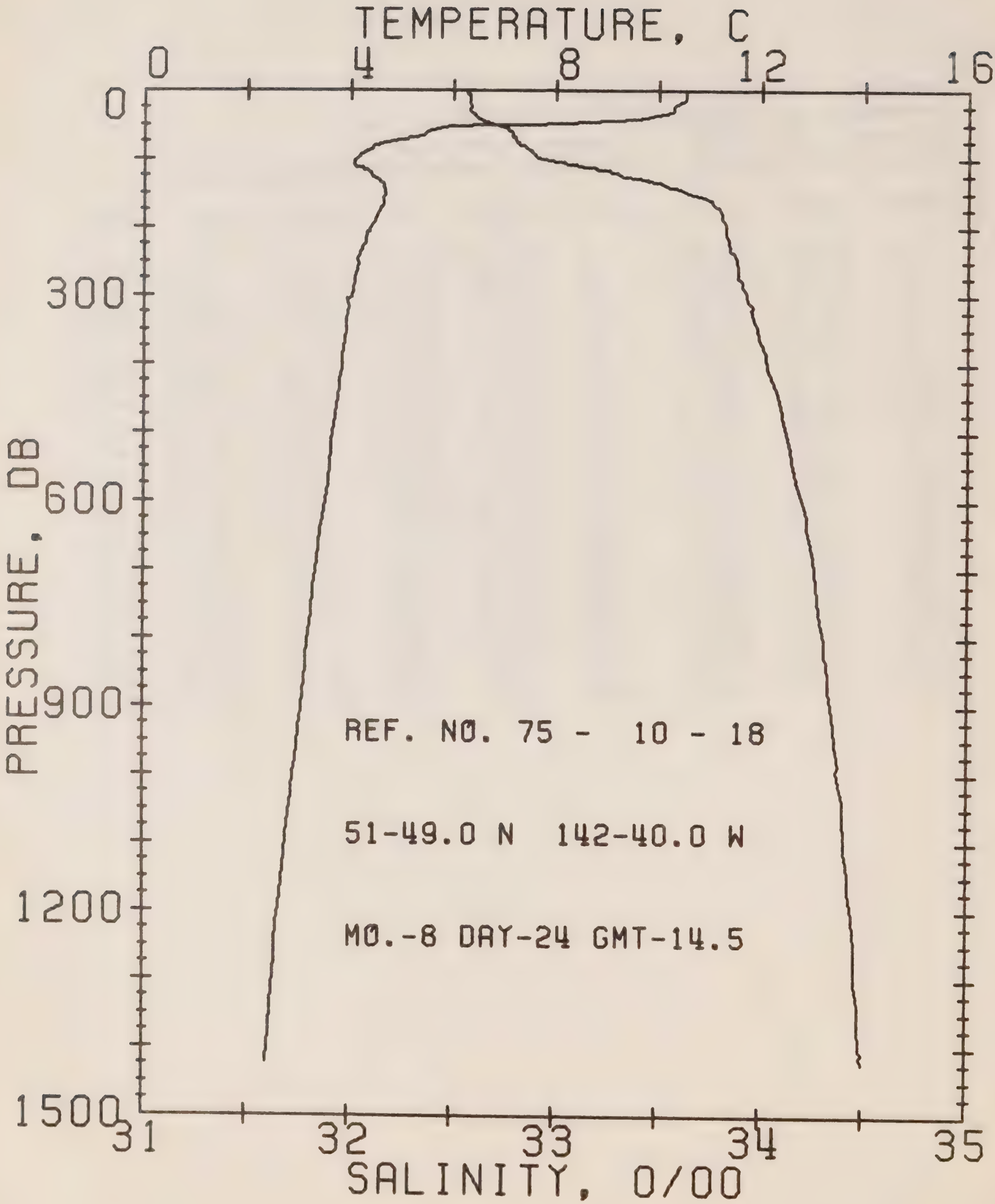
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 75 - 10 - 17
52-0.0 N 145-0.0 W
MO.-8 DAY-24 GMT-6.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 17 DATE 24/ 8/75
POSITION 52- 0.0N. 145- 0.0W GMT 6.0
RESULTS OF STP CAST 185 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.67	32.55	0	24.95	301.3	0.0	0.0	1490.
10	10.63	32.56	10	24.97	300.4	0.30	0.02	1490.
20	10.54	32.57	20	24.99	298.3	0.60	0.06	1490.
30	10.49	32.57	30	25.00	297.7	0.90	0.14	1490.
50	6.00	32.74	50	25.79	222.0	1.41	0.34	1473.
75	4.69	32.79	75	25.98	204.0	1.95	0.68	1468.
100	3.65	32.93	99	26.20	183.4	2.43	1.11	1464.
125	4.10	33.48	124	26.60	146.3	2.85	1.60	1467.
150	4.09	33.74	149	26.80	127.1	3.19	2.07	1468.
175	3.97	33.81	174	26.87	121.0	3.50	2.58	1468.
200	3.92	33.86	199	26.92	116.5	3.80	3.15	1468.
225	3.90	33.90	223	26.95	113.8	4.09	3.77	1469.
250	3.87	33.93	248	26.97	111.6	4.37	4.45	1469.
300	3.82	33.98	298	27.02	107.6	4.92	5.98	1470.
400	3.70	34.08	397	27.11	99.7	5.95	9.67	1471.
500	3.56	34.16	496	27.19	92.9	6.91	14.06	1472.
600	3.36	34.24	595	27.27	85.6	7.80	19.04	1473.
800	3.06	34.34	792	27.38	76.5	9.41	30.52	1475.
1000	2.79	34.41	990	27.46	69.6	10.86	43.82	1477.
1200	2.54	34.47	1187	27.53	63.6	12.20	58.72	1480.


TEMPERATURE, C
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4
8
12
16
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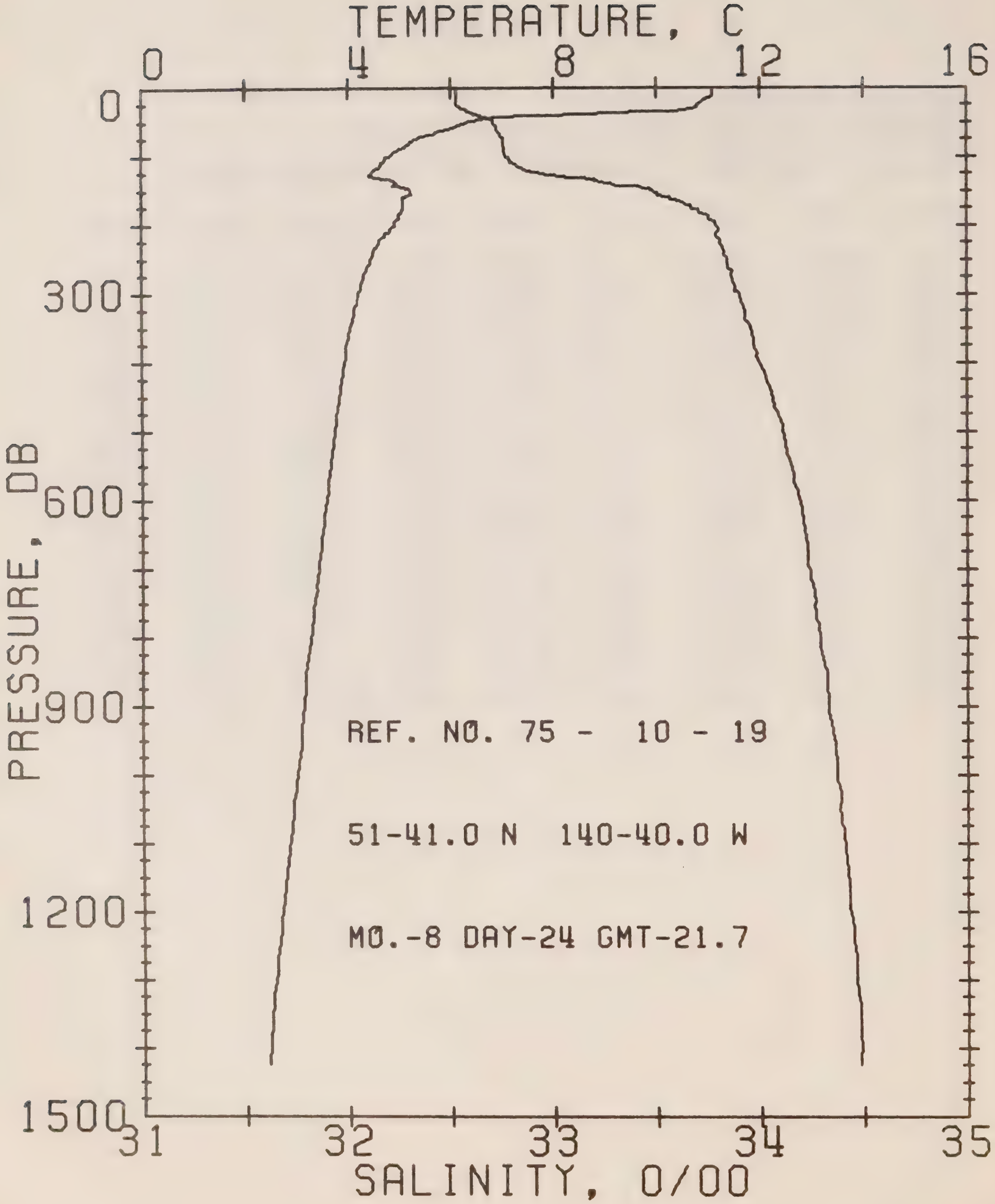
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 18
51-49.0 N 142-40.0 W
MO.-8 DAY-24 GMT-14.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 18 DATE 24/ 8/75
POSITION 51-49.0N, 142-40.0W GMT 14.5
RESULTS OF STP CAST 198 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	10.53	32.57	0	24.99	297.6	0.0	0.0	1489.
10	10.53	32.58	10	25.00	297.2	0.30	0.02	1489.
20	10.35	32.58	20	25.03	294.5	0.59	0.06	1489.
30	10.25	32.59	30	25.05	292.3	0.89	0.14	1489.
50	6.59	32.71	50	25.70	231.4	1.44	0.36	1475.
75	4.69	32.81	75	26.00	202.4	1.97	0.70	1468.
100	4.11	32.94	99	26.16	187.0	2.46	1.13	1466.
125	4.42	33.33	124	26.44	161.0	2.88	1.62	1468.
150	4.67	33.66	149	26.67	139.2	3.26	2.14	1470.
175	4.56	33.80	174	26.80	128.0	3.59	2.69	1470.
200	4.38	33.83	199	26.84	123.8	3.90	3.29	1470.
225	4.25	33.84	223	26.86	121.8	4.21	3.95	1470.
250	4.15	33.88	248	26.91	118.1	4.51	4.68	1470.
300	4.02	33.93	298	26.96	113.5	5.09	6.30	1470.
400	3.84	34.03	397	27.05	105.1	6.18	10.18	1471.
500	3.66	34.12	496	27.15	96.9	7.19	14.79	1472.
600	3.51	34.20	595	27.23	90.2	8.12	20.05	1473.
800	3.18	34.31	793	27.34	80.2	9.82	32.14	1476.
1000	2.91	34.37	990	27.42	73.5	11.36	46.23	1478.
1200	2.62	34.45	1188	27.50	66.2	12.76	61.85	1480.


TEMPERATURE, C
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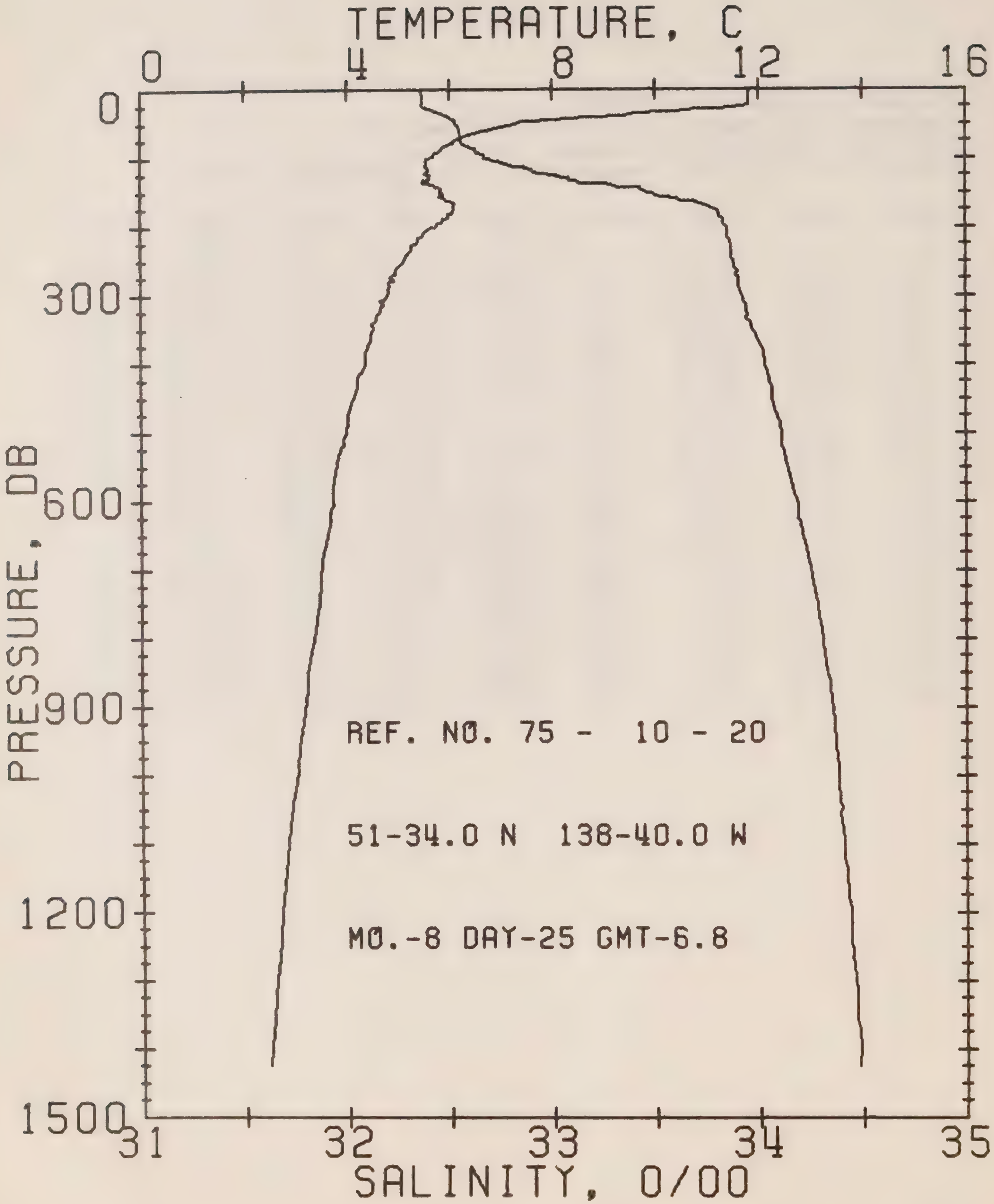
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 19
51-41.0 N 140-40.0 W
MO.-8 DAY-24 GMT-21.7
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 19 DATE 24/ 8/75
POSITION 51-41.0N, 140-40.0W GMT 21.7
RESULTS OF STP CAST 295 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	11.10	32.53	0	24.86	310.0	0.0	0.0	1491.
10	11.09	32.53	10	24.86	310.3	0.31	0.02	1491.
20	10.86	32.53	20	24.90	306.7	0.62	0.06	1491.
30	10.70	32.56	30	24.95	301.9	0.92	0.14	1490.
50	6.29	32.71	50	25.73	227.7	1.44	0.35	1474.
75	5.30	32.75	75	25.88	213.5	1.99	0.70	1470.
100	4.74	32.78	99	25.97	205.5	2.51	1.16	1469.
125	4.46	32.97	124	26.15	188.5	3.01	1.74	1468.
150	5.21	33.48	149	26.48	158.3	3.44	2.33	1472.
175	5.06	33.68	174	26.65	142.2	3.81	2.95	1472.
200	4.89	33.79	199	26.75	132.3	4.15	3.60	1472.
225	4.59	33.81	223	26.80	127.7	4.48	4.31	1471.
250	4.43	33.84	248	26.84	124.1	4.79	5.07	1471.
300	4.18	33.90	298	26.92	117.3	5.40	6.76	1471.
400	3.92	34.00	397	27.02	108.1	6.52	10.77	1472.
500	3.73	34.11	496	27.13	98.4	7.55	15.47	1473.
600	3.56	34.19	595	27.21	91.8	8.50	20.81	1474.
800	3.25	34.29	793	27.32	82.4	10.24	33.18	1476.
1000	2.99	34.37	990	27.41	74.8	11.81	47.51	1478.
1200	2.68	34.43	1188	27.49	67.9	13.23	63.43	1480.


TEMPERATURE, C
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8
12
16
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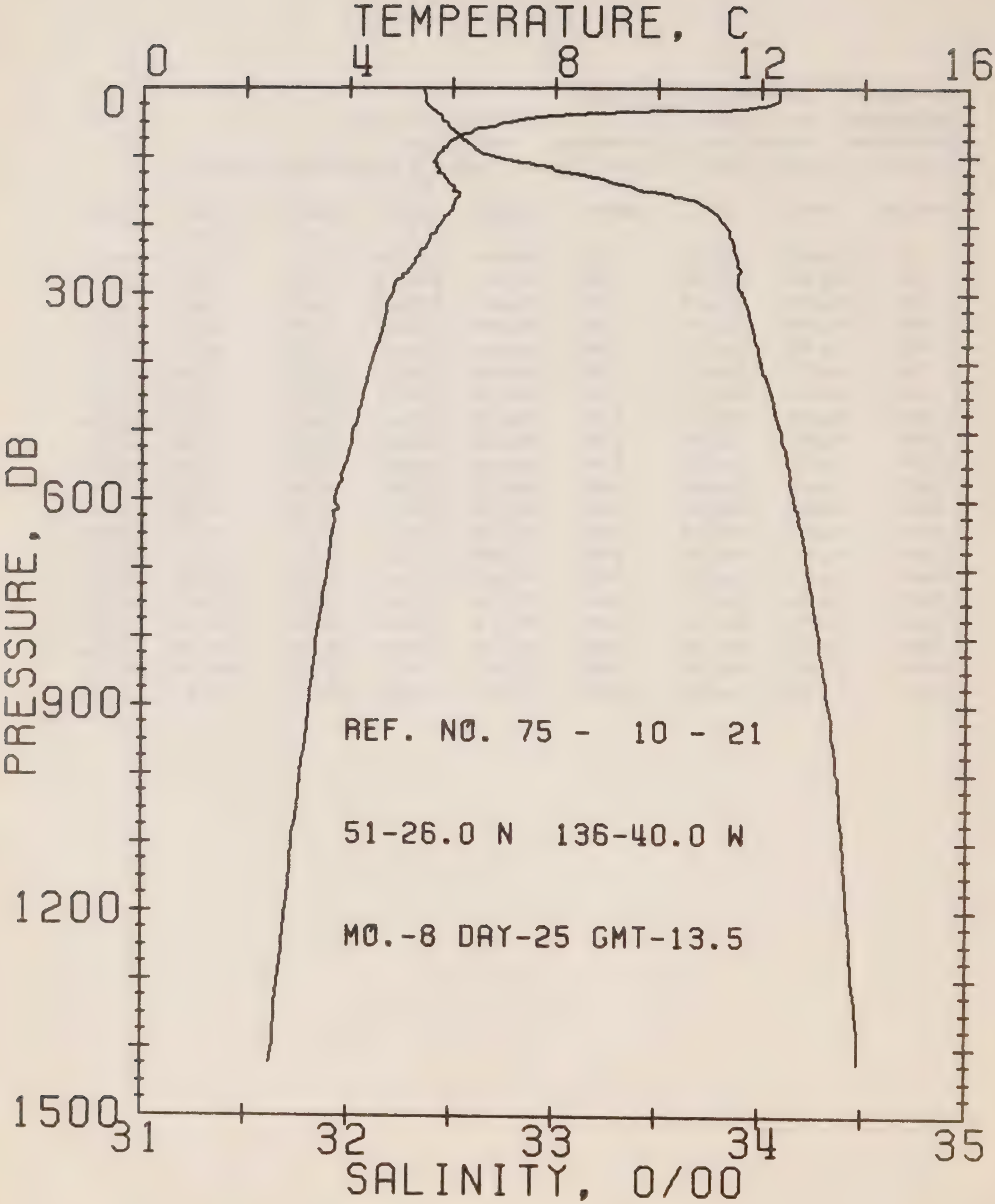
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 20
51-34.0 N 138-40.0 W
MO.-8 DAY-25 GMT-6.8
31
32
33
34
35
SALINITY, O/OO

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 20 DATE 25/ 8/75
POSITION 51-34.0N, 138-40.0W GMT 6.8
RESULTS OF STP CAST 243 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.80	32.37	0	24.61	333.8	0.0	0.0	1493.
10	11.80	32.37	10	24.61	334.3	0.33	0.02	1494.
20	11.80	32.37	20	24.61	334.5	0.67	0.07	1494.
30	10.60	32.42	30	24.86	310.6	0.99	0.15	1490.
50	7.29	32.53	50	25.46	253.8	1.55	0.37	1478.
75	6.07	32.55	75	25.64	237.2	2.16	0.76	1473.
100	5.58	32.67	99	25.79	222.9	2.73	1.27	1472.
125	5.59	33.02	124	26.06	197.1	3.26	1.87	1473.
150	5.86	33.49	149	26.40	165.5	3.71	2.50	1475.
175	6.06	33.79	174	26.62	145.4	4.09	3.14	1477.
200	5.64	33.84	199	26.71	137.0	4.45	3.82	1475.
225	5.29	33.86	223	26.77	131.5	4.78	4.55	1474.
250	5.08	33.88	248	26.80	128.3	5.11	5.33	1474.
300	4.76	33.92	298	26.87	122.4	5.74	7.08	1473.
400	4.33	34.03	397	27.00	110.2	6.89	11.20	1473.
500	3.96	34.11	496	27.11	101.1	7.94	16.02	1474.
600	3.71	34.18	595	27.19	93.6	8.92	21.48	1474.
800	3.33	34.31	793	27.33	81.6	10.67	33.92	1476.
1000	3.00	34.38	990	27.42	74.1	12.22	48.08	1478.
1200	2.69	34.44	1188	27.49	67.4	13.63	63.93	1480.


TEMPERATURE, C
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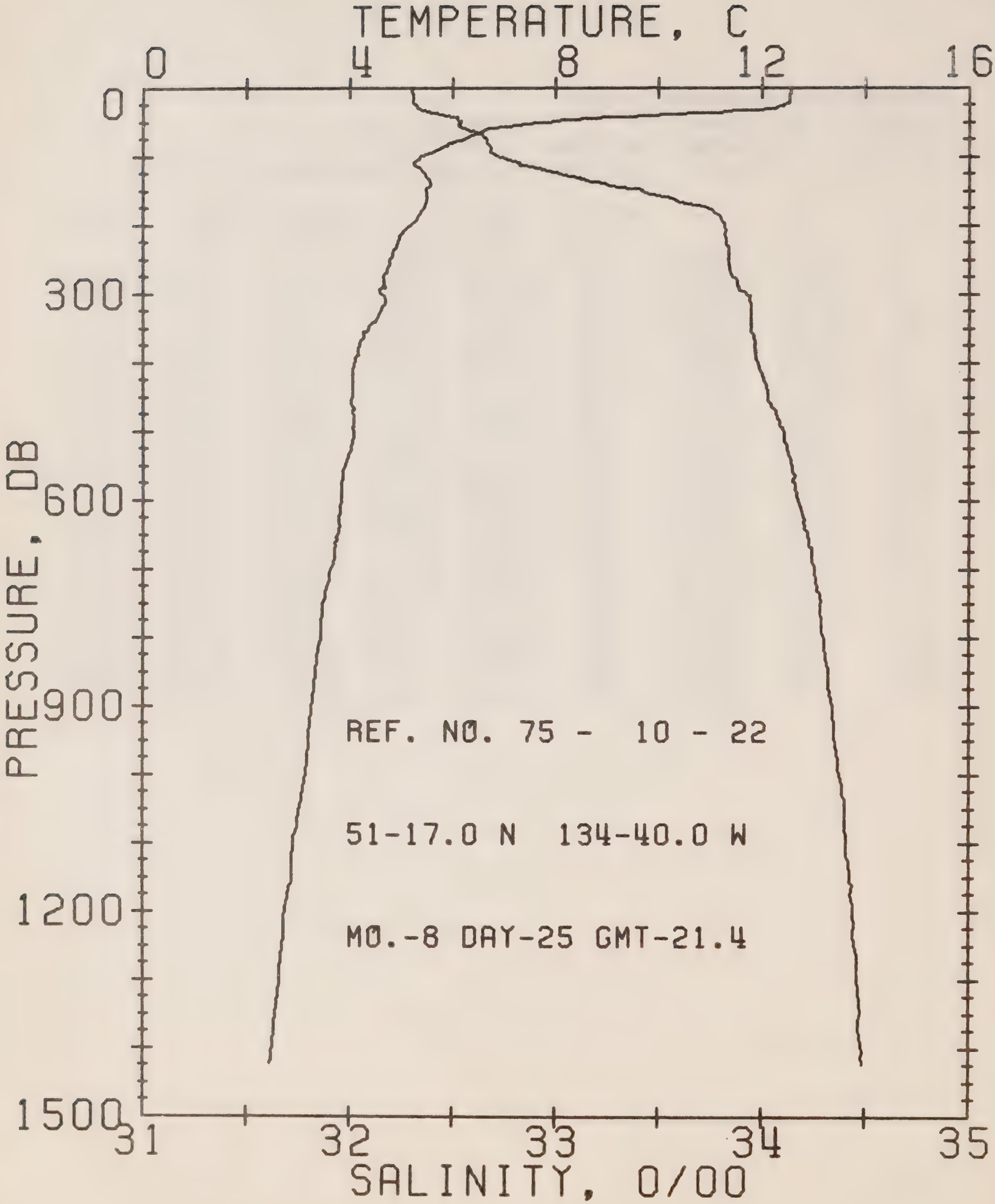
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 21
51-26.0 N 136-40.0 W
MO.-8 DAY-25 GMT-13.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 21 DATE 25/ 8/75
POSITION 51-26.0N. 136-40.0W GMT 13.5
RESULTS OF STP CAST 238 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.34	32.35	0	24.49	344.9	0.0	0.0	1495.
10	12.34	32.37	10	24.51	344.2	0.34	0.02	1495.
20	12.27	32.37	20	24.52	342.9	0.69	0.07	1495.
30	11.64	32.40	30	24.66	329.7	1.03	0.16	1493.
50	6.98	32.47	50	25.46	254.2	1.58	0.38	1476.
75	6.00	32.56	75	25.65	235.8	2.19	0.77	1473.
100	5.69	32.71	99	25.81	221.2	2.76	1.28	1472.
125	5.81	33.13	124	26.12	191.6	3.27	1.86	1474.
150	6.05	33.48	149	26.37	168.5	3.73	2.50	1476.
175	6.00	33.74	174	26.59	148.4	4.12	3.14	1476.
200	5.72	33.83	199	26.69	138.9	4.48	3.83	1476.
225	5.51	33.86	223	26.74	134.4	4.82	4.57	1475.
250	5.27	33.88	248	26.78	130.2	5.15	5.37	1475.
300	4.84	33.91	298	26.85	123.9	5.78	7.15	1474.
400	4.42	34.00	397	26.97	113.3	6.97	11.36	1474.
500	4.06	34.10	496	27.09	103.0	8.05	16.31	1474.
600	3.74	34.16	595	27.17	95.7	9.04	21.87	1474.
800	3.37	34.29	793	27.31	83.8	10.83	34.63	1476.
1000	3.08	34.37	990	27.40	75.4	12.43	49.19	1478.
1200	2.79	34.42	1188	27.47	69.8	13.87	65.38	1481.


TEMPERATURE, C
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16
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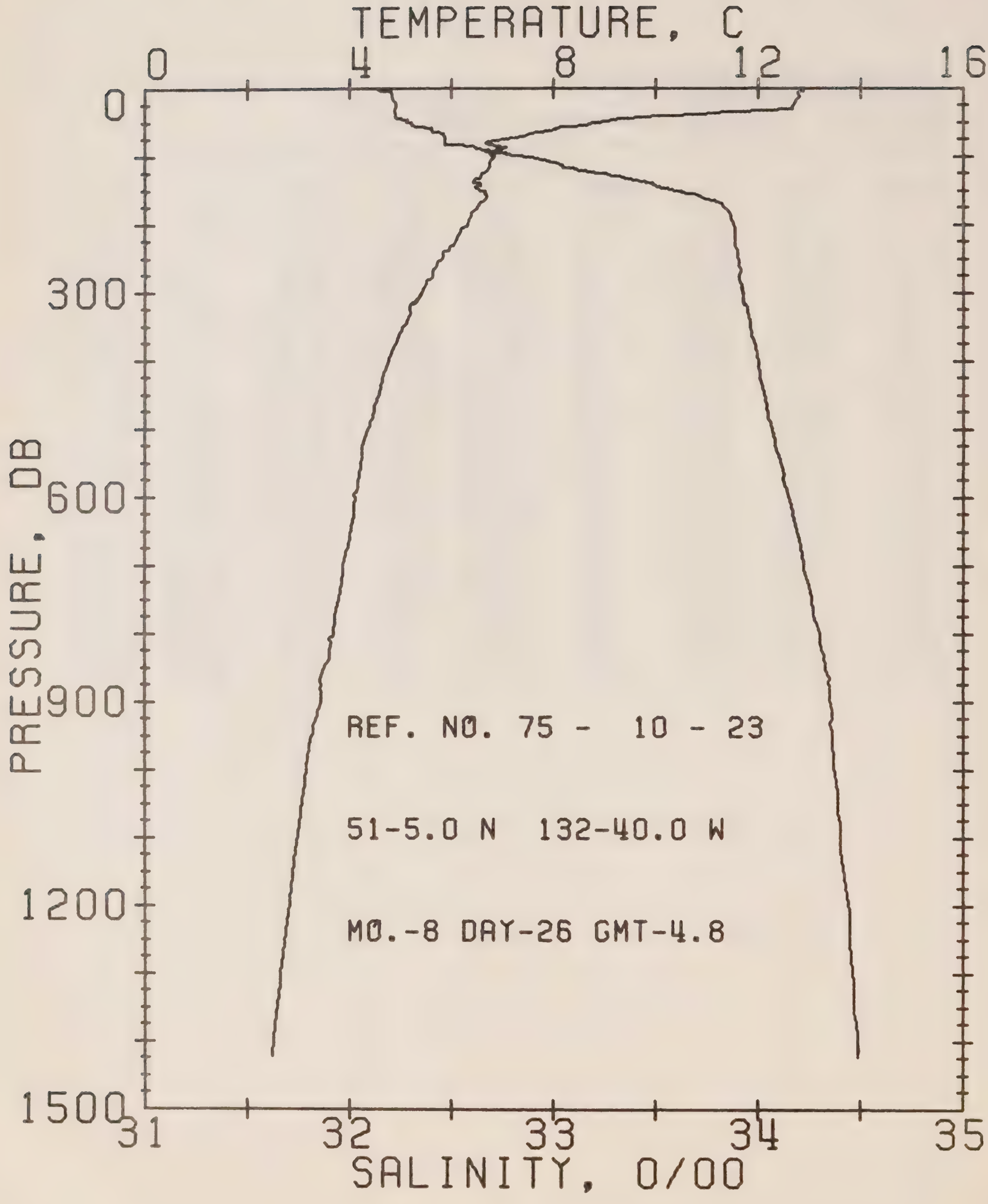
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 75 - 10 - 22
51-17.0 N 134-40.0 W
MØ.-8 DAY-25 GMT-21.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 22   DATE 25/ 8/75
POSITION   51-17.0N, 134-40.0W   GMT 21.4
RESULTS OF STP CAST   307 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.56	32.30	0	24.41	352.7	0.0	0.0	1496.
10	12.52	32.31	10	24.43	351.6	0.35	0.02	1496.
20	12.52	32.31	20	24.43	351.8	0.70	0.07	1496.
30	12.16	32.34	30	24.52	343.3	1.05	0.16	1495.
50	7.75	32.54	50	25.40	259.2	1.64	0.40	1480.
75	6.21	32.66	75	25.71	230.4	2.24	0.78	1474.
100	5.36	32.74	99	25.87	215.2	2.80	1.28	1471.
125	5.47	33.04	124	26.09	194.2	3.32	1.86	1472.
150	5.49	33.42	149	26.39	166.1	3.77	2.50	1473.
175	5.41	33.75	174	26.66	140.9	4.15	3.13	1474.
200	5.16	33.82	199	26.75	133.1	4.49	3.78	1473.
225	4.92	33.83	223	26.78	130.0	4.82	4.49	1473.
250	4.78	33.84	248	26.81	127.9	5.14	5.27	1473.
300	4.63	33.93	298	26.89	119.9	5.76	7.01	1473.
400	4.08	33.98	397	26.99	111.1	6.92	11.13	1472.
500	4.08	34.11	496	27.09	102.6	7.99	16.02	1474.
600	3.83	34.18	595	27.17	95.5	8.98	21.55	1475.
800	3.43	34.30	793	27.31	83.5	10.75	34.16	1477.
1000	3.14	34.38	990	27.40	75.9	12.34	48.74	1479.
1200	2.75	34.44	1188	27.49	68.1	13.77	64.78	1480.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16
PRESSURE, DB
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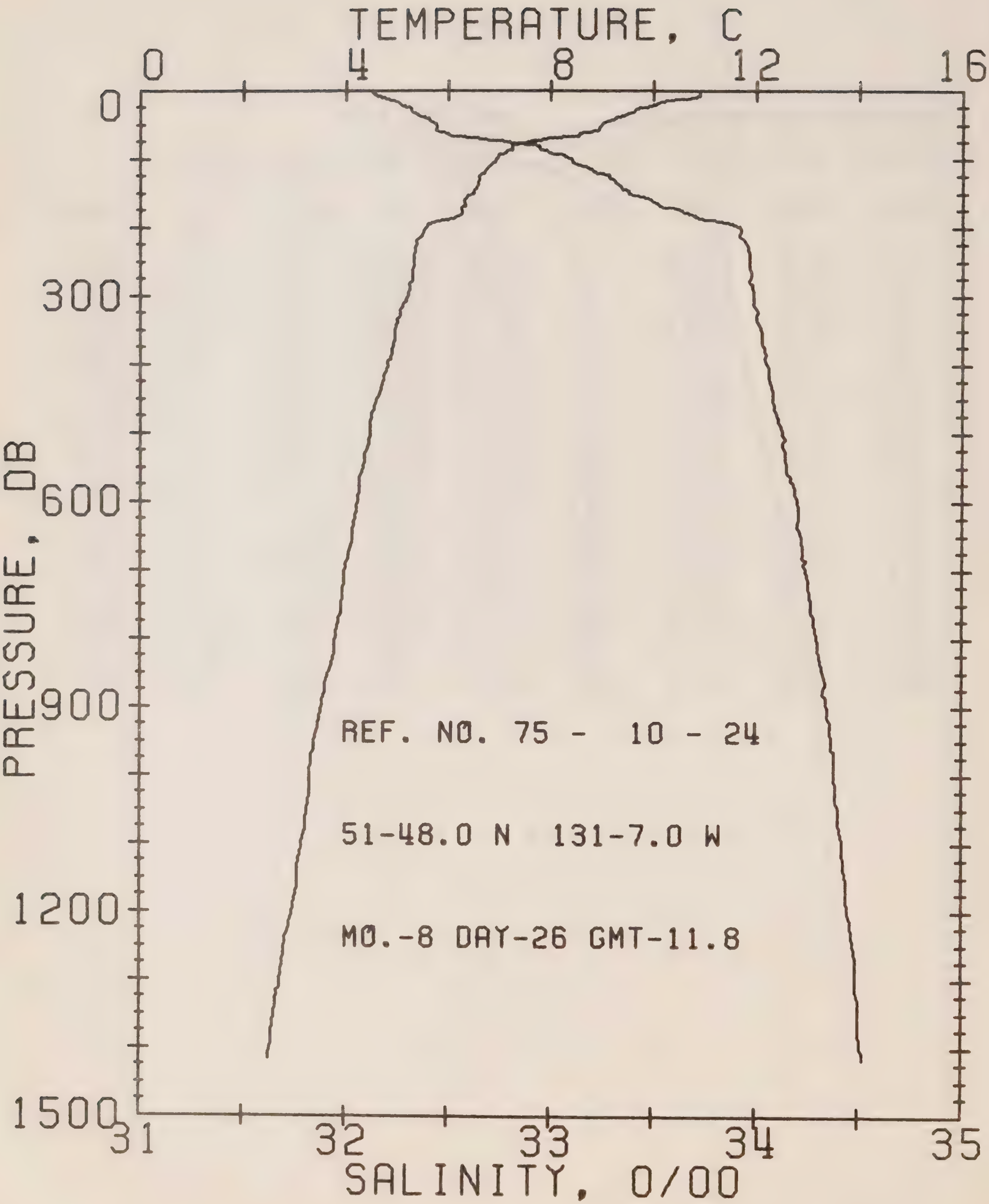
300
600
900
1200
1500
REF. NO. 75 - 10 - 23
51-5.0 N 132-40.0 W
MO.-8 DAY-26 GMT-4.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 23 DATE 26/ 8/75
POSITION 51- 5.0N, 132-40.0W GMT 4.8
RESULTS OF STP CAST 224 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.89	32.14	0	24.23	370.5	0.0	0.0	1497.
10	12.79	32.21	10	24.30	363.9	0.37	0.02	1497.
20	12.71	32.22	20	24.33	361.6	0.73	0.07	1497.
30	12.59	32.23	30	24.35	359.2	1.09	0.17	1497.
50	8.74	32.30	50	25.07	291.0	1.73	0.42	1483.
75	6.88	32.47	75	25.47	253.2	2.41	0.85	1476.
100	6.84	32.87	99	25.79	222.9	3.01	1.39	1477.
125	6.58	33.27	124	26.14	190.4	3.53	1.98	1477.
150	6.62	33.63	149	26.42	164.5	3.97	2.60	1478.
175	6.51	33.84	174	26.60	147.7	4.36	3.24	1478.
200	6.31	33.88	199	26.65	142.5	4.72	3.93	1478.
225	6.07	33.89	223	26.69	139.1	5.07	4.69	1478.
250	5.81	33.90	248	26.73	135.5	5.41	5.52	1477.
300	5.40	33.92	298	26.80	129.6	6.07	7.37	1476.
400	4.76	34.00	397	26.93	117.3	7.30	11.74	1475.
500	4.34	34.07	496	27.04	108.2	8.43	16.92	1475.
600	4.11	34.15	595	27.13	100.3	9.47	22.76	1476.
800	3.67	34.30	793	27.29	86.1	11.34	36.03	1478.
1000	3.13	34.37	990	27.40	76.1	12.95	50.73	1479.
1200	2.81	34.44	1188	27.48	68.4	14.40	66.99	1481.


TEMPERATURE, C
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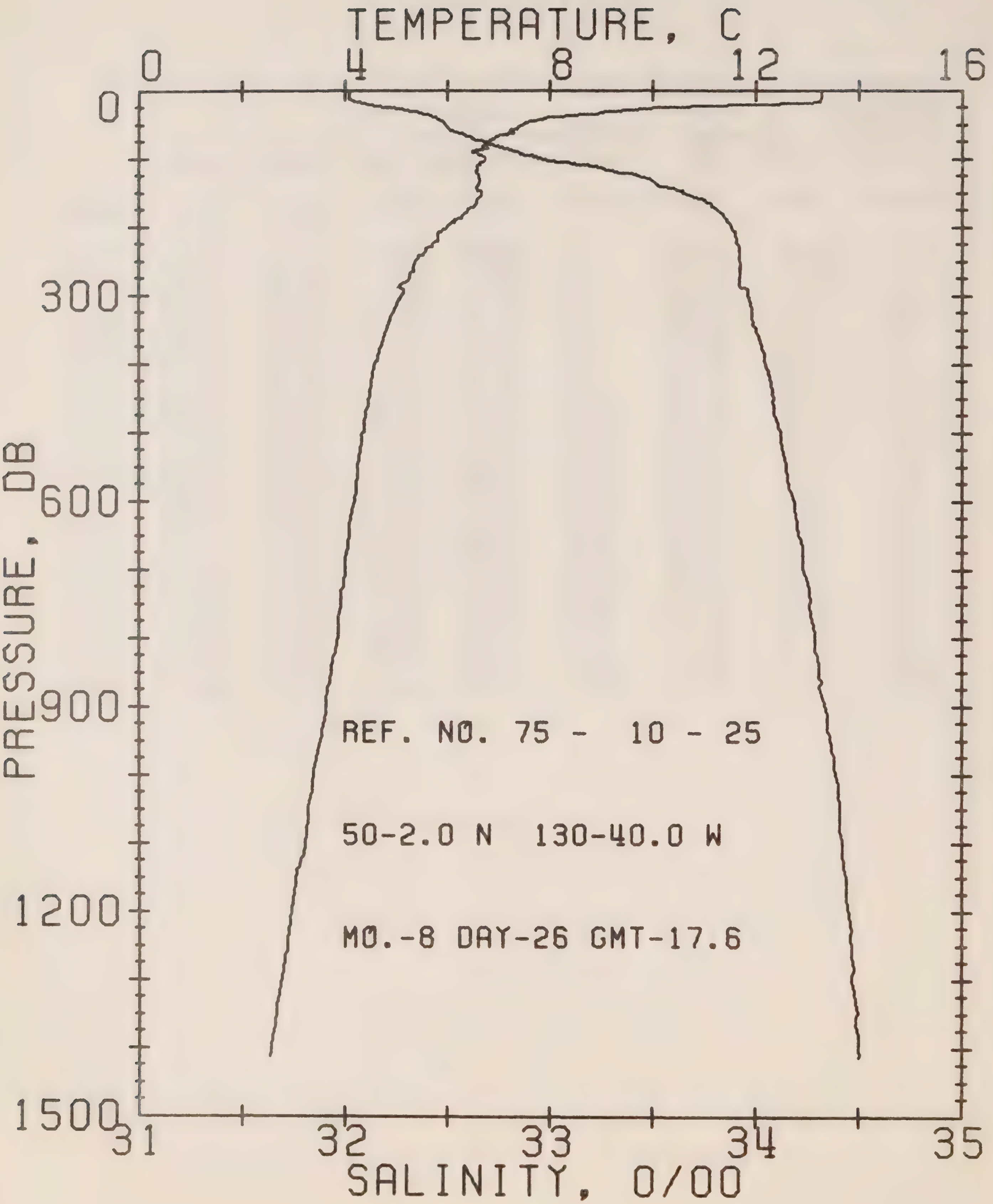
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 24
51-48.0 N 131-7.0 W
MO.-8 DAY-26 GMT-11.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 24 DATE 26/ 8/75
POSITION 51-48.0N, 131- 7.0W GMT 11.8
RESULTS OF STP CAST 306 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.90	32.13	0	24.59	336.2	0.0	0.0	1490.
10	10.82	32.19	10	24.65	330.9	0.33	0.02	1490.
20	10.03	32.27	20	24.84	312.4	0.65	0.07	1487.
30	9.61	32.32	30	24.95	301.9	0.96	0.14	1486.
50	8.98	32.44	50	25.14	284.1	1.54	0.38	1484.
75	7.52	32.81	75	25.65	236.4	2.22	0.81	1479.
100	6.92	33.10	99	25.96	207.1	2.76	1.29	1478.
125	6.62	33.29	124	26.15	189.4	3.26	1.86	1477.
150	6.49	33.38	149	26.24	181.4	3.72	2.51	1477.
175	6.28	33.64	174	26.47	159.7	4.14	3.21	1477.
200	5.54	33.92	199	26.78	129.9	4.51	3.90	1475.
225	5.37	33.95	223	26.83	125.9	4.83	4.59	1475.
250	5.34	33.97	248	26.84	124.5	5.14	5.35	1475.
300	5.21	33.99	298	26.88	122.1	5.76	7.08	1475.
400	4.82	34.05	397	26.97	114.1	6.94	11.28	1476.
500	4.47	34.13	496	27.07	105.2	8.03	16.30	1476.
600	4.22	34.20	595	27.15	98.1	9.05	22.02	1477.
800	3.81	34.30	793	27.27	87.9	10.92	35.30	1478.
1000	3.31	34.38	990	27.39	77.6	12.56	50.31	1479.
1200	2.97	34.45	1188	27.47	69.9	14.04	66.83	1481.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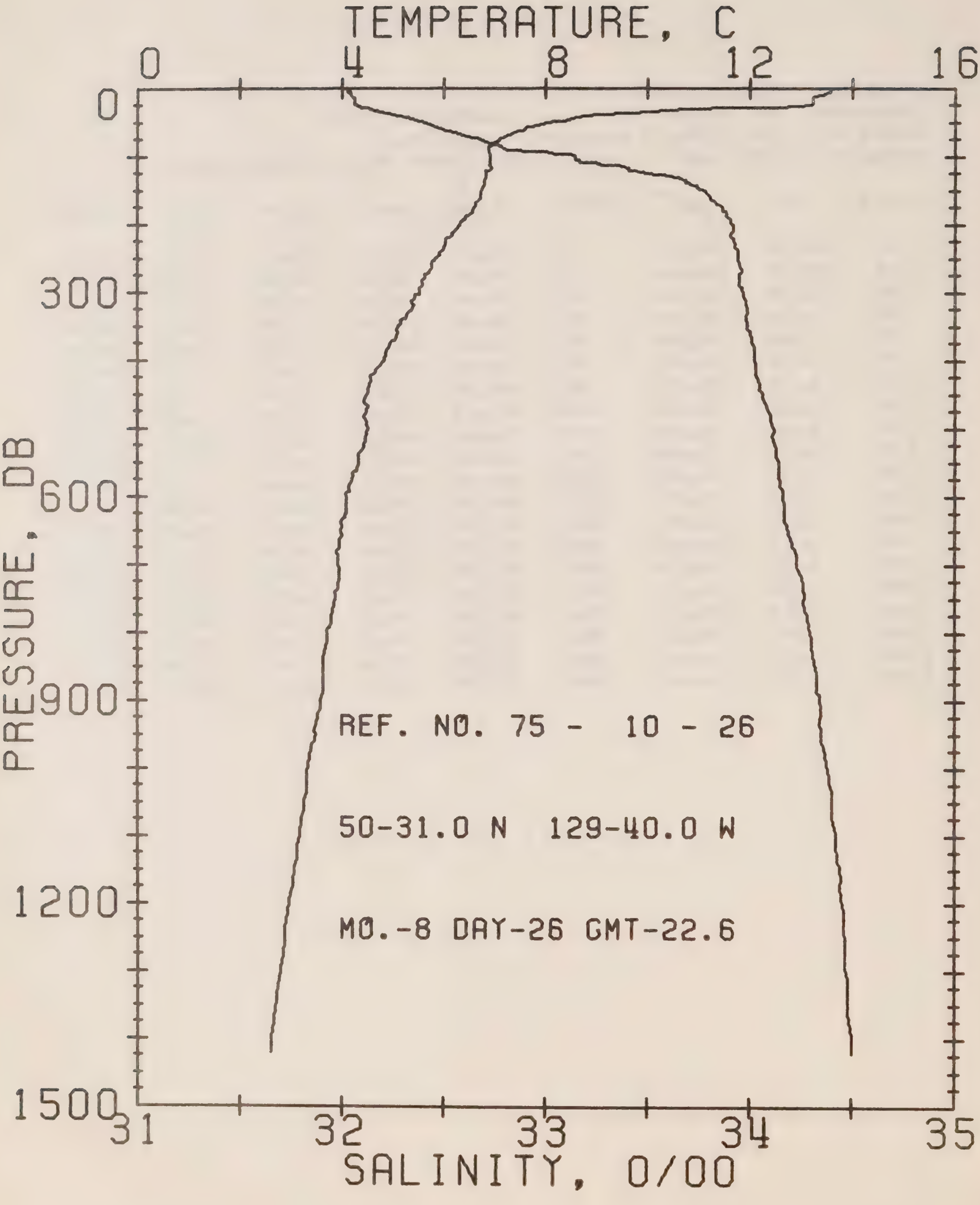
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 25
50-2.0 N 130-40.0 W
MO.-8 DAY-26 GMT-17.6
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 25 DATE 26/ 8/75
POSITION 50- 2.0N, 130-40.0W GMT 17.6
RESULTS OF STP CAST 255 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.29	32.02	0	24.05	386.7	0.0	0.0	1498.
10	13.27	32.02	10	24.06	386.8	0.39	0.02	1498.
20	11.91	32.12	20	24.40	354.8	0.77	0.08	1494.
30	9.11	32.35	30	25.05	292.4	1.09	0.16	1484.
50	7.42	32.49	50	25.42	258.1	1.63	0.38	1478.
75	6.75	32.68	75	25.65	235.9	2.25	0.77	1476.
100	6.72	32.99	99	25.90	213.1	2.81	1.27	1477.
125	6.62	33.44	124	26.27	178.3	3.29	1.82	1478.
150	6.66	33.65	149	26.43	163.5	3.72	2.42	1478.
175	6.38	33.82	174	26.60	147.4	4.10	3.06	1478.
200	5.96	33.88	199	26.70	138.0	4.46	3.74	1477.
225	5.71	33.91	223	26.75	132.9	4.80	4.47	1476.
250	5.37	33.92	248	26.80	128.5	5.12	5.26	1475.
300	5.10	33.96	298	26.87	122.8	5.75	7.03	1475.
400	4.57	34.05	397	26.99	111.7	6.92	11.19	1475.
500	4.33	34.12	496	27.08	104.3	8.00	16.14	1475.
600	4.17	34.19	595	27.15	98.5	9.02	21.84	1476.
800	3.83	34.29	793	27.26	88.7	10.89	35.15	1478.
1000	3.39	34.39	990	27.38	77.9	12.56	50.44	1480.
1200	2.95	34.45	1188	27.48	69.4	14.04	66.97	1481.


TEMPERATURE, C
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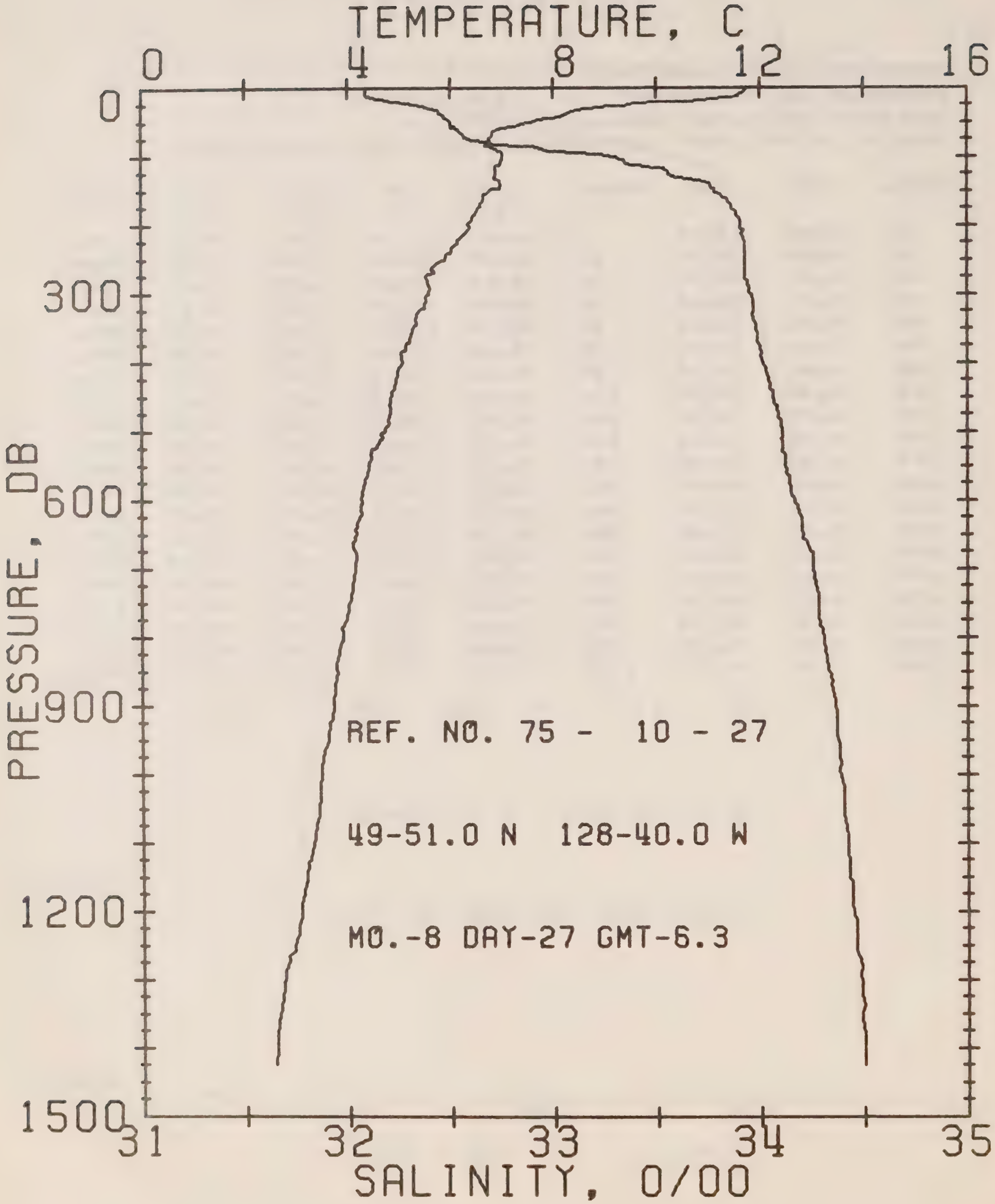
PRESSURE, DB
REF. NO. 75 - 10 - 26
50-31.0 N 129-40.0 W
MO.-8 DAY-26 GMT-22.6
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 26 DATE 26/ 8/75
POSITION 50-31.0N, 129-40.0W GMT 22.6
RESULTS OF STP CAST 299 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.58	32.03	0	24.00	391.6	0.0	0.0	1499.
10	13.34	32.05	10	24.07	386.0	0.39	0.02	1499.
20	13.22	32.06	20	24.10	383.2	0.77	0.08	1498.
30	10.81	32.14	30	24.61	334.8	1.14	0.17	1490.
50	8.04	32.41	50	25.26	272.8	1.74	0.41	1481.
75	7.09	32.69	75	25.61	239.6	2.38	0.82	1478.
100	6.90	33.15	99	26.00	203.2	2.93	1.31	1478.
125	6.84	33.54	124	26.32	173.7	3.41	1.86	1479.
150	6.72	33.78	149	26.52	154.7	3.82	2.42	1479.
175	6.58	33.86	174	26.60	146.9	4.19	3.05	1479.
200	6.31	33.92	199	26.68	139.6	4.55	3.73	1478.
225	6.03	33.92	223	26.72	136.3	4.90	4.48	1477.
250	5.82	33.94	248	26.76	132.6	5.23	5.29	1477.
300	5.51	33.97	298	26.82	127.3	5.88	7.11	1477.
400	4.81	34.02	397	26.95	116.2	7.09	11.43	1475.
500	4.48	34.11	496	27.06	106.5	8.20	16.48	1476.
600	4.07	34.16	595	27.14	99.4	9.23	22.26	1476.
800	3.72	34.29	793	27.28	87.1	11.10	35.54	1478.
1000	3.32	34.38	990	27.38	77.8	12.75	50.69	1480.
1200	2.95	34.45	1188	27.48	69.4	14.23	67.20	1481.


TEMPERATURE, C
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PRESSURE, DB
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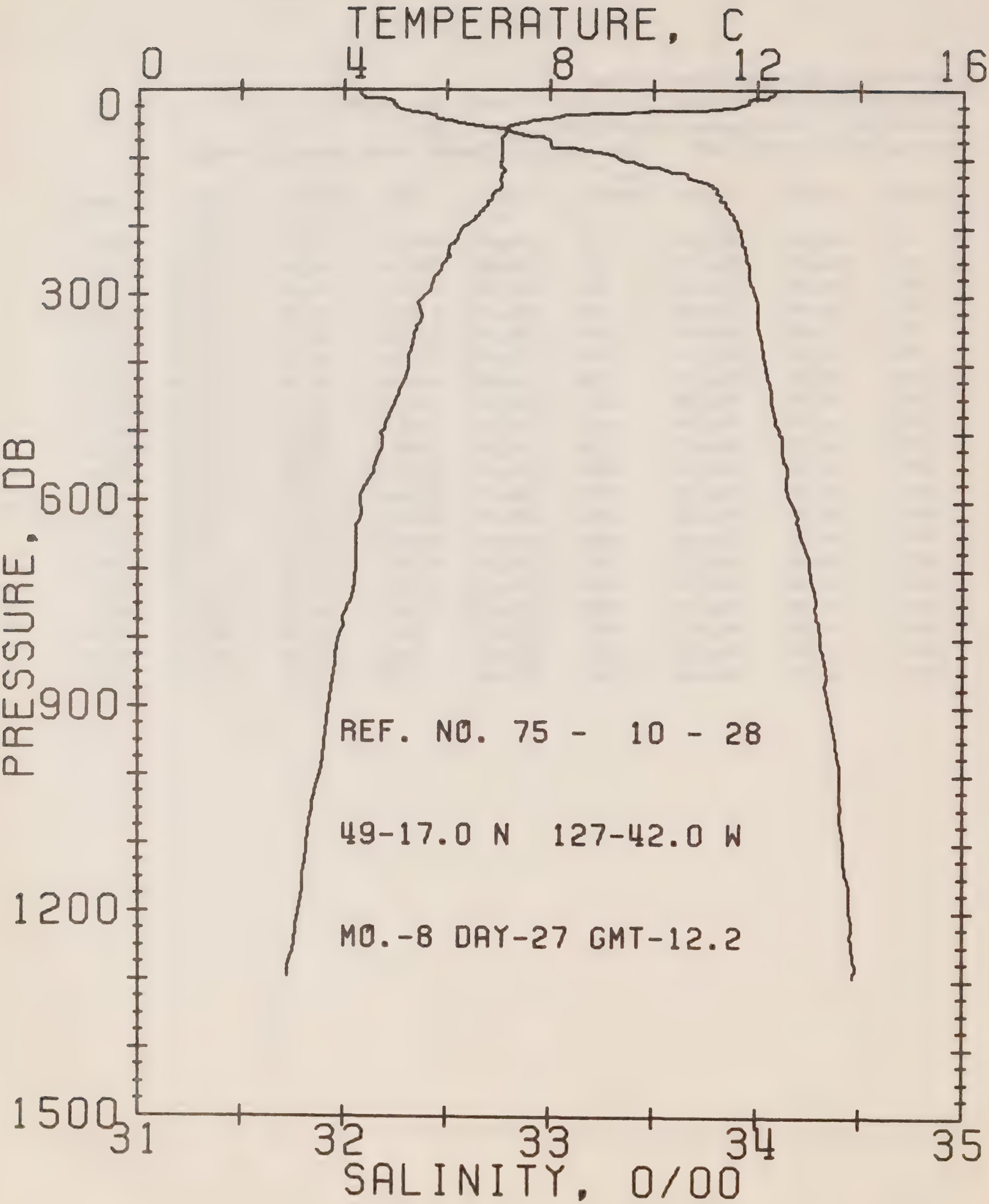
REF. NO. 75 - 10 - 27
49-51.0 N 128-40.0 W
MO.-8 DAY-27 GMT-6.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 27 DATE 27/ 8/75
POSITION 49-51.0N, 128-40.0W GMT 6.3
RESULTS OF STP CAST 344 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.64	32.09	0	24.42	351.7	0.0	0.0	1493.
10	11.61	32.09	10	24.43	351.4	0.35	0.02	1493.
20	10.?4	32.25	20	24.82	314.0	0.69	0.07	1487.
30	8.60	32.42	30	25.19	279.7	0.99	0.14	1482.
50	7.55	32.50	50	25.40	259.4	1.53	0.36	1479.
75	6.76	32.61	75	25.59	241.3	2.15	0.76	1476.
100	7.01	33.29	99	26.09	194.4	2.69	1.24	1478.
125	6.87	33.56	124	26.33	172.5	3.15	1.76	1479.
150	6.76	33.78	149	26.52	155.0	3.56	2.33	1479.
175	6.53	33.87	174	26.62	145.7	3.93	2.95	1479.
200	6.36	33.91	199	26.67	140.9	4.29	3.63	1478.
225	6.12	33.93	223	26.72	136.8	4.63	4.39	1478.
250	5.84	33.93	248	26.75	133.7	4.97	5.20	1477.
300	5.56	33.96	298	26.81	128.5	5.63	7.03	1477.
400	5.05	34.01	397	26.91	119.7	6.86	11.45	1476.
500	4.68	34.11	496	27.03	109.1	8.00	16.67	1477.
600	4.28	34.16	595	27.12	101.3	9.06	22.56	1477.
800	3.90	34.31	793	27.27	88.1	10.94	35.92	1479.
1000	3.47	34.38	990	27.37	79.2	12.59	51.09	1480.
1200	3.07	34.45	1188	27.46	71.2	14.09	67.91	1482.



TEMPERATURE, C
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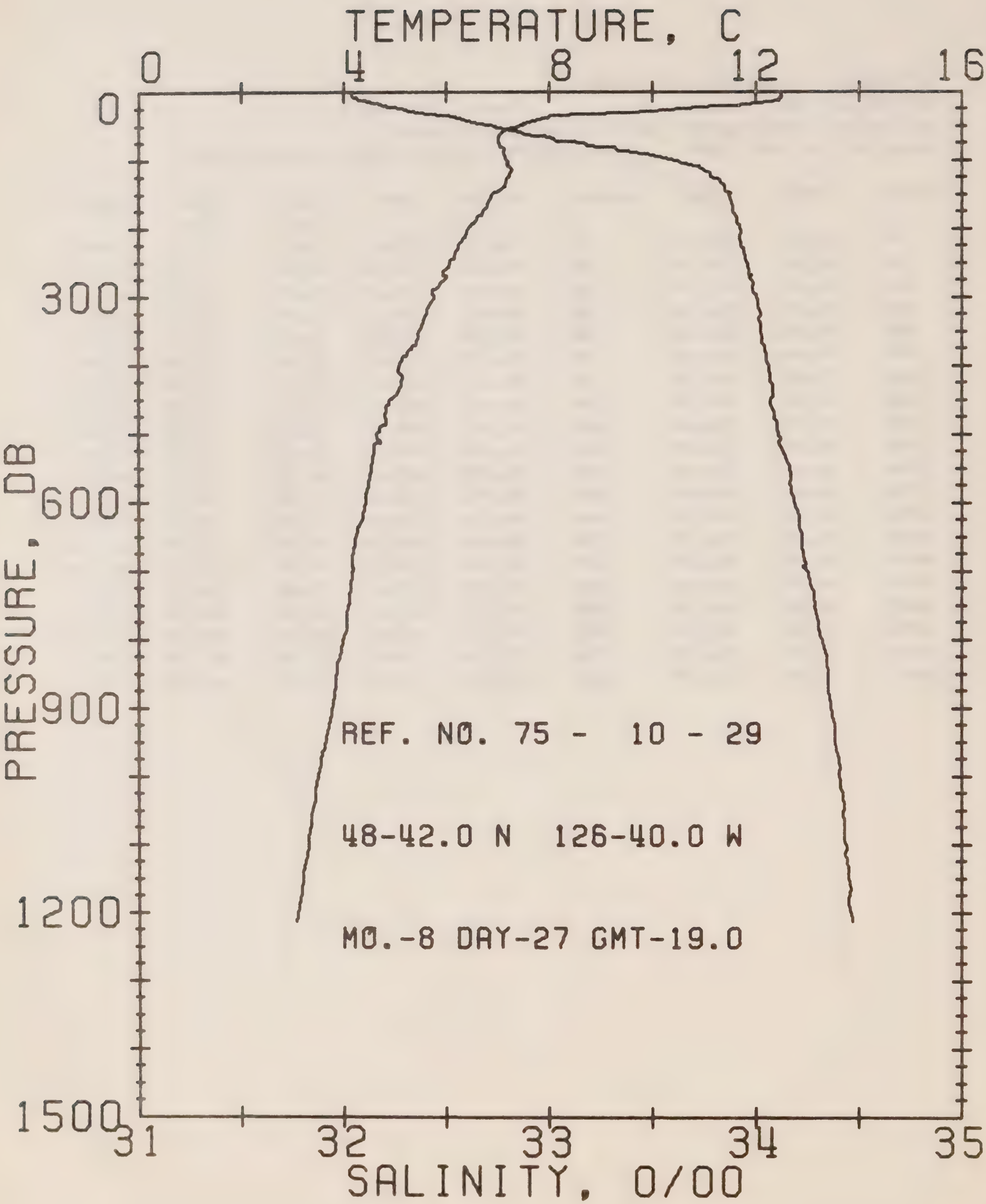
PRESSURE, DB
REF. NO. 75 - 10 - 28
49-17.0 N 127-42.0 W
MO.-8 DAY-27 GMT-12.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 28 DATE 27/ 8/75
POSITION 49-17.0N, 127-42.0W GMT 12.2
RESULTS OF STP CAST 297 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.35	32.08	0	24.28	365.0	0.0	0.0	1495.
10	12.21	32.10	10	24.32	361.4	0.36	0.02	1495.
20	11.81	32.24	20	24.51	344.3	0.71	0.07	1494.
30	9.92	32.32	30	24.90	307.1	1.05	0.16	1487.
50	7.35	32.62	50	25.52	247.8	1.59	0.38	1478.
75	7.08	33.00	75	25.86	216.3	2.16	0.74	1478.
100	7.06	33.34	99	26.13	191.1	2.67	1.19	1479.
125	7.06	33.66	124	26.38	167.6	3.12	1.70	1480.
150	6.94	33.80	149	26.51	156.0	3.52	2.26	1480.
175	6.69	33.87	174	26.60	147.8	3.90	2.89	1479.
200	6.32	33.91	199	26.68	140.4	4.26	3.58	1478.
225	6.09	33.93	223	26.72	136.4	4.61	4.33	1478.
250	5.98	33.95	248	26.75	133.8	4.94	5.14	1478.
300	5.59	33.99	298	26.83	126.6	5.59	6.97	1477.
400	5.25	34.04	397	26.91	120.2	6.83	11.37	1477.
500	4.72	34.11	496	27.03	109.5	7.98	16.65	1477.
600	4.31	34.16	595	27.11	102.1	9.05	22.61	1477.
800	3.89	34.31	793	27.27	87.8	10.94	36.08	1479.
1000	3.52	34.40	990	27.38	78.6	12.61	51.35	1480.
1200	3.12	34.45	1188	27.46	71.5	14.11	68.16	1482.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900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 29
48-42.0 N 126-40.0 W
MO.-8 DAY-27 GMT-19.0
31
32
33
34
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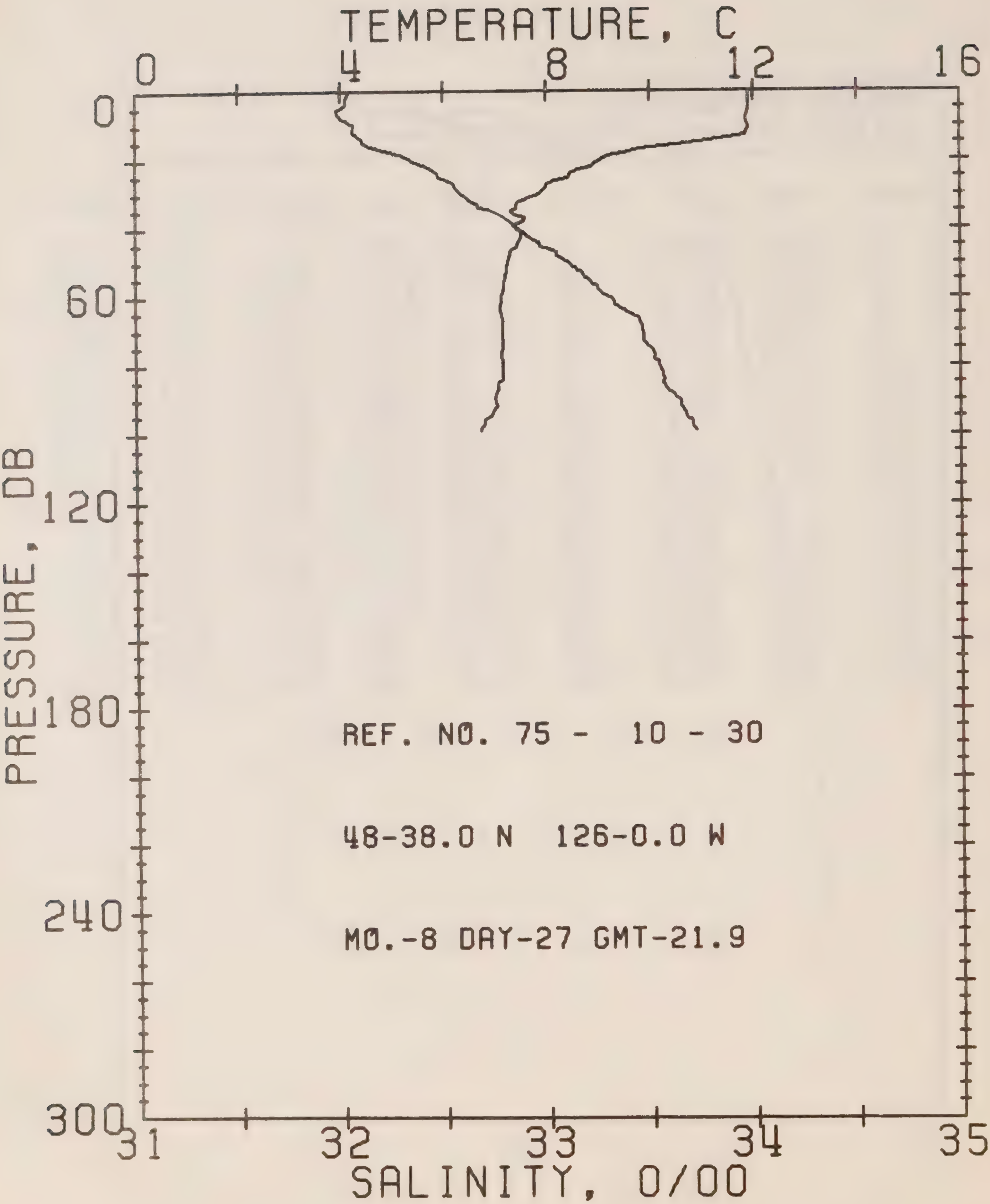
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 29   DATE 27/ 8/75
POSITION 48-42.0N, 126-40.0W   GMT 19.0
RESULTS OF STP CAST   302 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.49	32.04	0	24.23	370.5	0.0	0.0	1495.
10	12.45	32.07	10	24.26	368.0	0.37	0.02	1496.
20	11.24	32.20	20	24.58	337.4	0.73	0.07	1492.
30	9.40	32.37	30	25.02	295.3	1.04	0.15	1485.
50	7.40	32.74	50	25.61	239.6	1.56	0.36	1478.
75	7.03	33.17	75	26.00	203.0	2.11	0.71	1478.
100	7.19	33.61	99	26.32	172.7	2.58	1.13	1480.
125	7.18	33.80	124	26.47	158.8	2.99	1.60	1480.
150	6.89	33.87	149	26.57	149.8	3.37	2.14	1480.
175	6.69	33.89	174	26.61	146.3	3.75	2.75	1479.
200	6.42	33.92	199	26.67	140.7	4.10	3.44	1479.
225	6.24	33.93	223	26.70	138.3	4.45	4.19	1478.
250	6.06	33.96	248	26.75	134.3	4.79	5.02	1478.
300	5.76	34.00	298	26.82	128.0	5.45	6.85	1478.
400	5.07	34.06	397	26.95	116.6	6.68	11.22	1477.
500	4.64	34.11	496	27.03	108.6	7.81	16.43	1477.
600	4.42	34.18	595	27.12	101.5	8.86	22.30	1477.
800	3.97	34.32	793	27.27	88.2	10.75	35.76	1479.
1000	3.49	34.40	991	27.39	78.0	12.41	50.93	1480.
1200	3.10	34.46	1188	27.47	70.7	13.89	67.50	1482.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PRESSURE, DB
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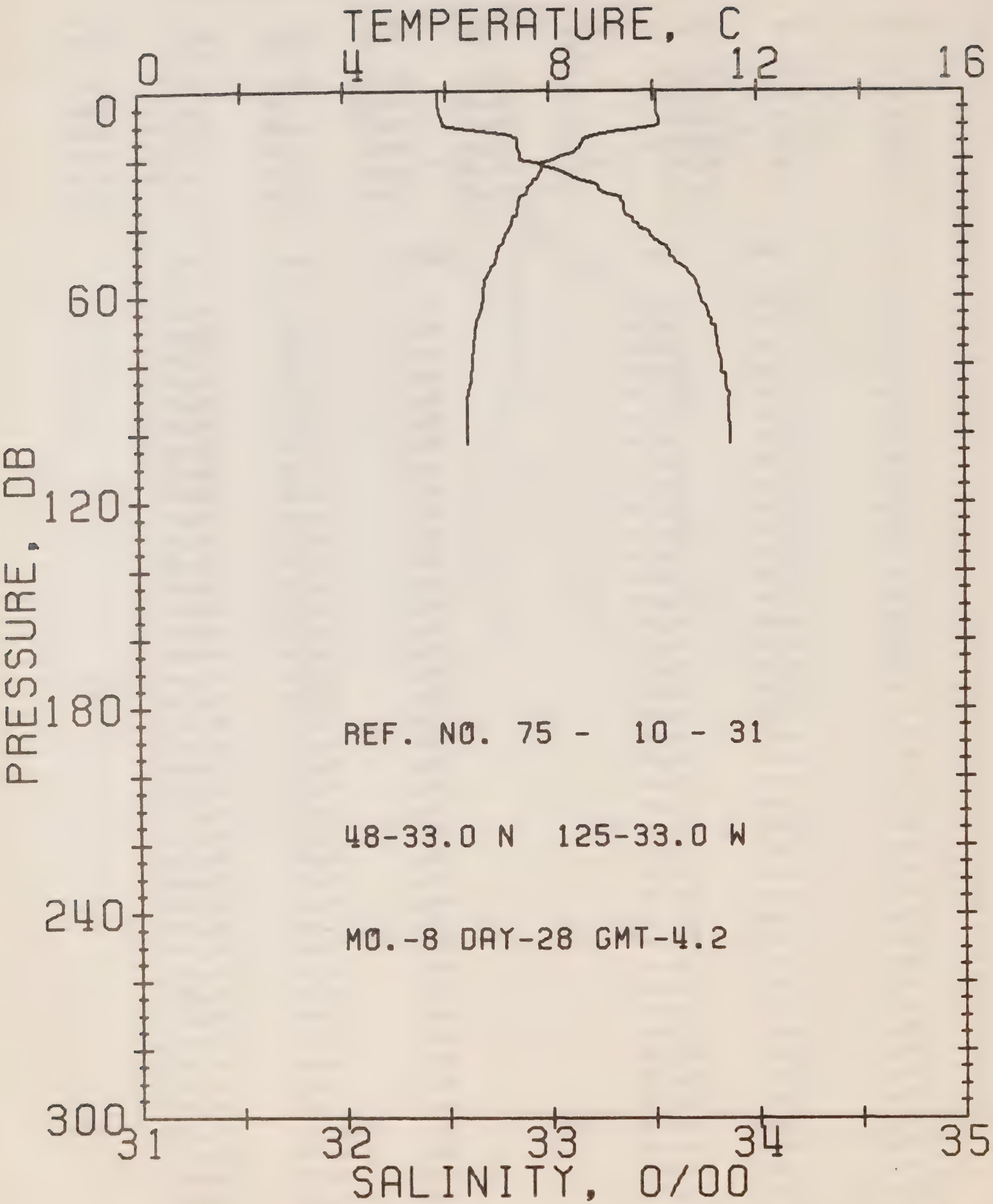
SALINITY, 0/00
REF. NO. 75 - 10 - 30
48-38.0 N 126-0.0 W
MO.-8 DAY-27 GMT-21.9

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 30 DATE 27/ 8/75
POSITION 48-38.0N, 126- 0.0W GMT 21.9
RESULTS OF STP CAST 87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.92	32.04	0	24.33	360.3	0.0	0.0	1493.
10	11.89	32.07	10	24.36	358.0	0.36	0.02	1494.
20	9.07	32.34	20	25.05	292.4	0.69	0.07	1484.
30	7.88	32.59	30	25.43	256.9	0.97	0.14	1480.
50	7.26	33.11	50	25.92	210.1	1.43	0.32	1478.
75	7.14	33.51	75	26.25	179.1	1.91	0.63	1479.

DEPTH	TEMP	SAL
0.	11.92	32.04
1.	11.92	32.04
3.	11.92	32.03
4.	11.92	32.03
5.	11.92	31.99
6.	11.91	31.98
7.	11.89	31.99
8.	11.88	32.01
9.	11.87	32.04
10.	11.89	32.07
11.	11.91	32.06
12.	11.90	32.06
13.	11.87	32.08
14.	11.34	32.10
15.	10.95	32.11
16.	10.26	32.15
17.	9.82	32.19
18.	9.48	32.26
19.	9.19	32.31
20.	9.07	32.34
21.	8.97	32.37
22.	8.87	32.42
23.	8.62	32.45
24.	8.49	32.47
25.	8.42	32.48
26.	8.19	32.52
27.	8.04	32.54
29.	7.95	32.57
30.	7.88	32.59
31.	7.71	32.61
32.	7.48	32.63
33.	7.43	32.66
34.	7.42	32.67
35.	7.31	32.75
36.	7.38	32.78
37.	7.61	32.81
38.	7.55	32.84
39.	7.38	32.86
40.	7.42	32.88
41.	7.49	32.91
43.	7.51	32.96
46.	7.36	33.03
49.	7.29	33.08
50.	7.26	33.11

DEPTH	TEMP	SAL
52.	7.23	33.15
53.	7.22	33.17
54.	7.21	33.18
55.	7.20	33.20
56.	7.17	33.22
57.	7.17	33.24
58.	7.16	33.25
59.	7.15	33.27
60.	7.13	33.31
61.	7.12	33.32
62.	7.11	33.33
63.	7.10	33.35
64.	7.10	33.38
65.	7.11	33.42
66.	7.13	33.44
67.	7.14	33.45
69.	7.15	33.46
70.	7.15	33.46
71.	7.15	33.47
73.	7.15	33.47
74.	7.15	33.49
75.	7.14	33.51
77.	7.13	33.52
78.	7.13	33.52
79.	7.14	33.54
80.	7.14	33.54
81.	7.14	33.55
82.	7.14	33.56
83.	7.14	33.56
84.	7.14	33.57
87.	7.06	33.58
88.	7.03	33.61
89.	7.01	33.62
90.	6.99	33.64
91.	7.02	33.65
92.	7.03	33.65
93.	6.99	33.66
94.	6.95	33.67
95.	6.86	33.68
96.	6.81	33.70
97.	6.80	33.70
98.	6.76	33.71
99.	6.71	33.72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PRESSURE, DB
REF. NO. 75 - 10 - 31
48-33.0 N 125-33.0 W
MO.-8 DAY-28 GMT-4.2
31
32
33
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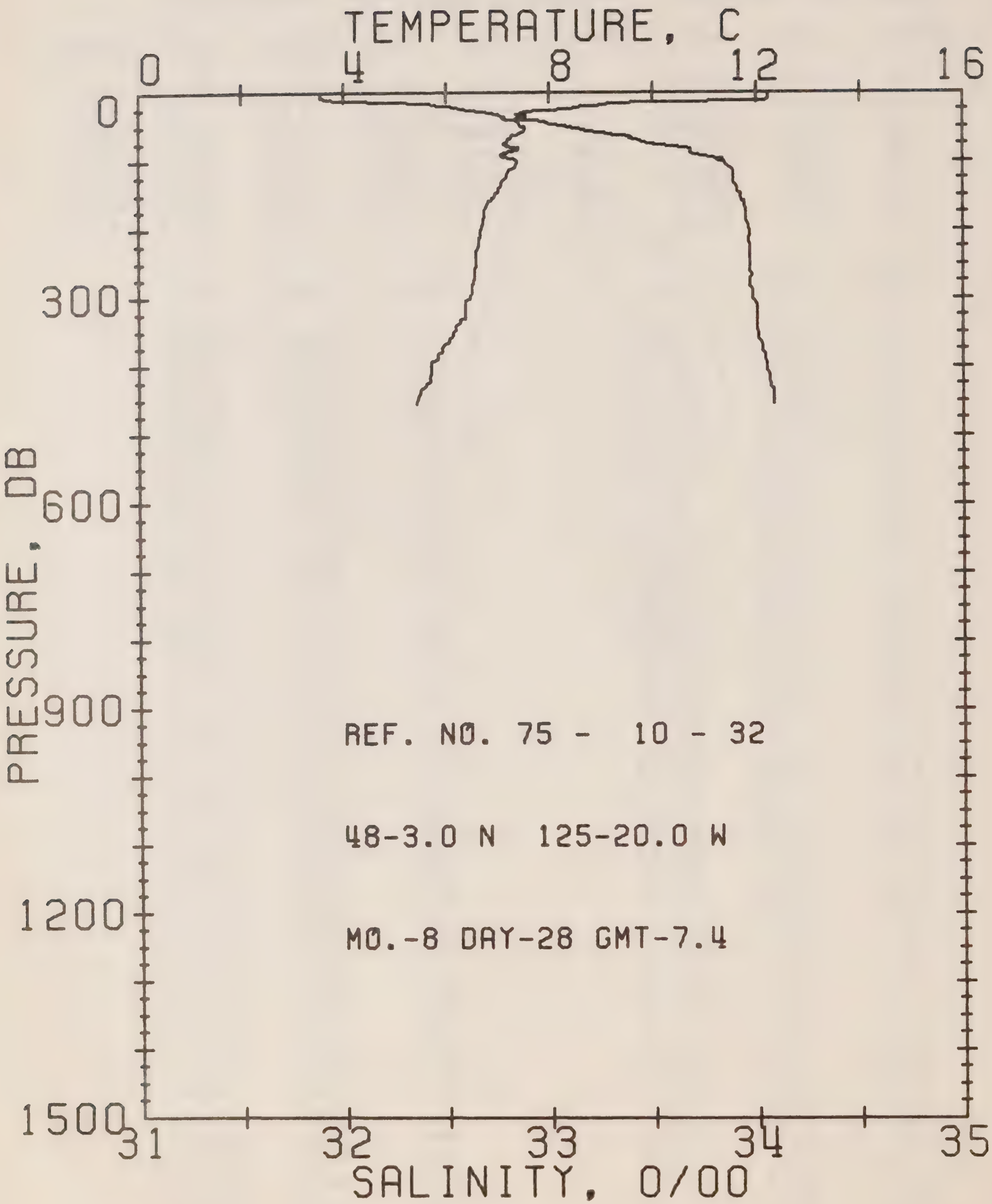
35
SALINITY, O/OO

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 31 DATE 28/ 8/75
POSITION 48-33.0N, 125-33.0W GMT 4.2
RESULTS OF STP CAST 83 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.09	32.46	0	24.98	298.6	0.0	0.0	1487.
10	10.14	32.49	10	24.99	297.6	0.30	0.02	1488.
20	8.10	32.86	20	25.60	239.7	0.55	0.05	1481.
30	7.57	33.29	30	26.02	200.5	0.77	0.11	1480.
50	6.95	33.61	50	26.36	168.8	1.14	0.26	1478.
75	6.53	33.81	75	26.57	148.7	1.53	0.50	1477.
100	6.40	33.87	99	26.63	143.1	1.89	0.83	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	10.09	32.46	47.	6.99	33.58
1.	10.09	32.46	48.	6.99	33.58
4.	10.09	32.46	49.	6.97	33.60
6.	10.09	32.47	50.	6.95	33.61
7.	10.11	32.47	51.	6.91	33.64
8.	10.13	32.48	52.	6.85	33.66
10.	10.14	32.49	53.	6.82	33.67
11.	9.83	32.56	54.	6.81	33.69
12.	9.20	32.73	55.	6.76	33.70
13.	8.90	32.82	56.	6.75	33.71
14.	8.67	32.85	58.	6.72	33.72
15.	8.64	32.85	59.	6.72	33.72
16.	8.60	32.85	61.	6.71	33.73
17.	8.56	32.85	62.	6.70	33.74
18.	8.47	32.86	63.	6.68	33.75
19.	8.25	32.86	65.	6.63	33.77
20.	8.10	32.86	66.	6.62	33.77
21.	7.88	32.94	67.	6.60	33.78
22.	7.86	32.99	68.	6.59	33.78
23.	7.86	33.05	69.	6.57	33.80
24.	7.82	33.08	70.	6.56	33.80
25.	7.78	33.13	74.	6.54	33.81
26.	7.72	33.16	78.	6.52	33.82
27.	7.67	33.22	79.	6.52	33.83
28.	7.59	33.24	80.	6.52	33.83
29.	7.58	33.24	81.	6.51	33.83
30.	7.57	33.29	82.	6.48	33.83
31.	7.44	33.35	83.	6.47	33.85
32.	7.42	33.35	84.	6.47	33.85
33.	7.41	33.36	86.	6.45	33.85
35.	7.40	33.36	87.	6.44	33.85
36.	7.39	33.37	88.	6.43	33.86
37.	7.32	33.40	89.	6.41	33.87
38.	7.28	33.41	90.	6.41	33.86
39.	7.27	33.43	93.	6.41	33.86
40.	7.23	33.44	94.	6.41	33.86
41.	7.20	33.48	95.	6.41	33.86
42.	7.14	33.49	96.	6.41	33.86
43.	7.11	33.50	98.	6.41	33.87
44.	7.11	33.53	102.	6.40	33.87
45.	7.04	33.57	103.	6.40	33.87
46.	7.00	33.57			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1500
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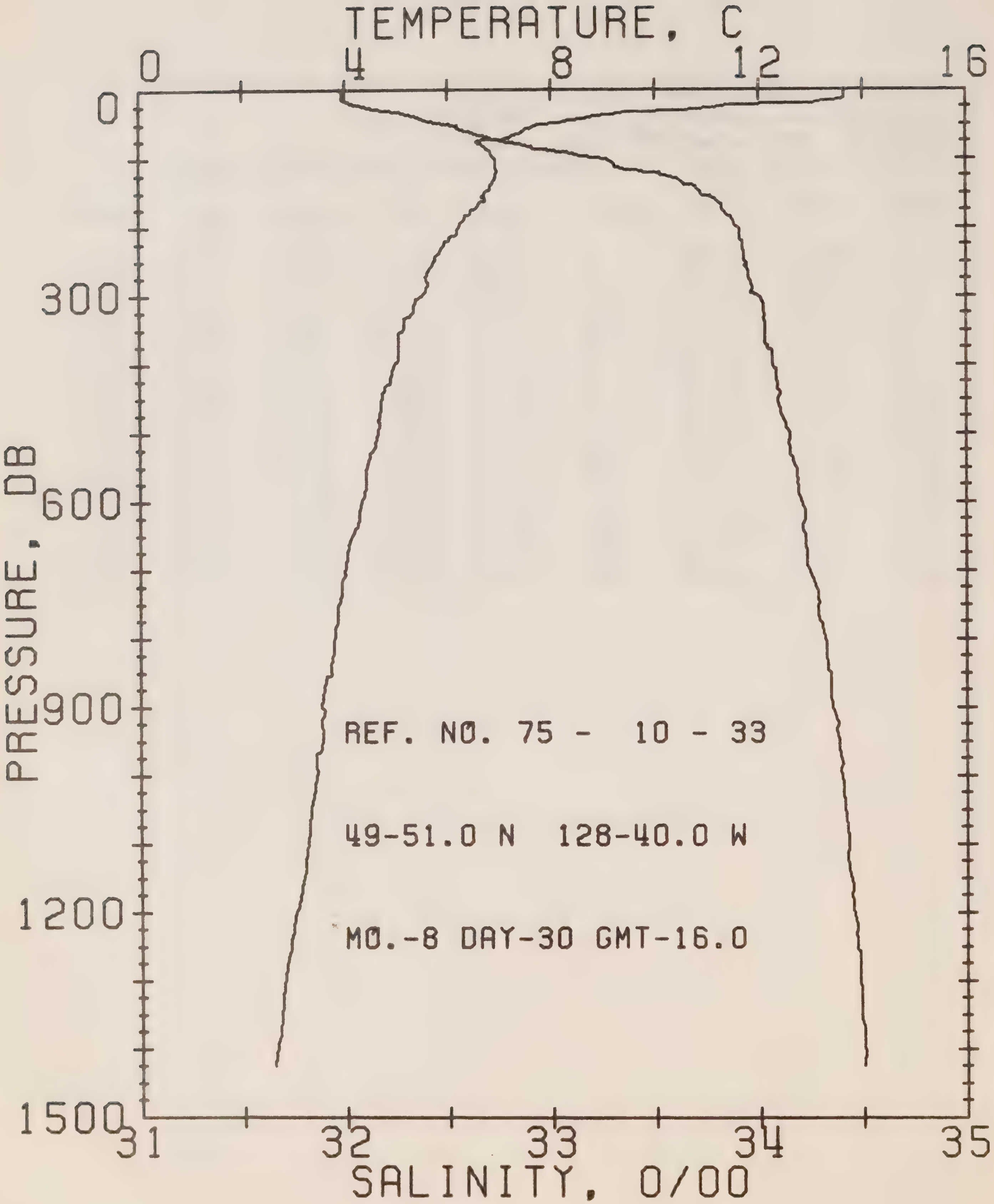
REF. NO. 75 - 10 - 32
48-3.0 N 125-20.0 W
MO.-8 DAY-28 GMT-7.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 32 DATE 28/ 8/75
POSITION 48- 3.0N, 125-20.0W GMT 7.4
RESULTS OF STP CAST 192 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.24	31.88	0	24.15	377.8	0.0	0.0	1494.
10	12.23	31.93	10	24.19	374.4	0.38	0.02	1495.
20	8.63	32.51	20	25.25	273.3	0.70	0.07	1482.
30	7.43	32.72	30	25.59	241.2	0.95	0.13	1478.
50	7.51	33.11	50	25.89	213.5	1.41	0.32	1479.
75	7.13	33.51	75	26.25	179.0	1.90	0.63	1479.
100	7.39	33.84	99	26.48	158.3	2.31	0.99	1481.
125	7.14	33.89	124	26.55	151.6	2.70	1.44	1480.
150	6.94	33.93	149	26.61	146.6	3.07	1.96	1480.
175	6.75	33.95	174	26.65	142.7	3.43	2.56	1480.
200	6.69	33.96	199	26.67	141.2	3.79	3.24	1480.
225	6.63	33.97	223	26.68	140.3	4.14	4.00	1480.
250	6.58	33.97	248	26.69	140.0	4.49	4.85	1480.
300	6.46	33.98	298	26.71	138.4	5.19	6.80	1480.
400	5.72	34.05	397	26.86	124.9	6.51	11.51	1479.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12
16
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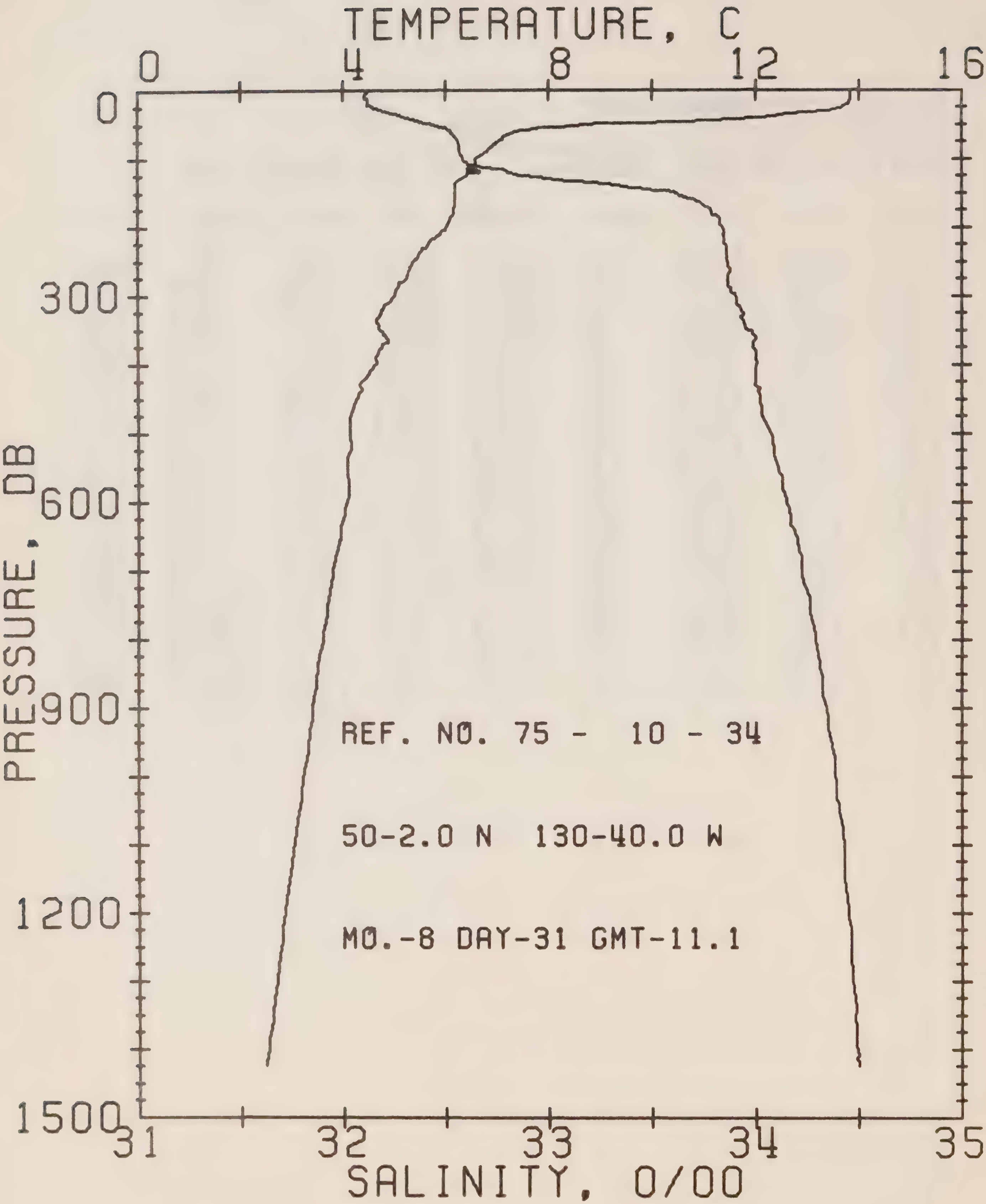
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 33
49-51.0 N 128-40.0 W
MO.-8 DAY-30 GMT-16.0
31
32
33
34
35
SALINITY, 0/00

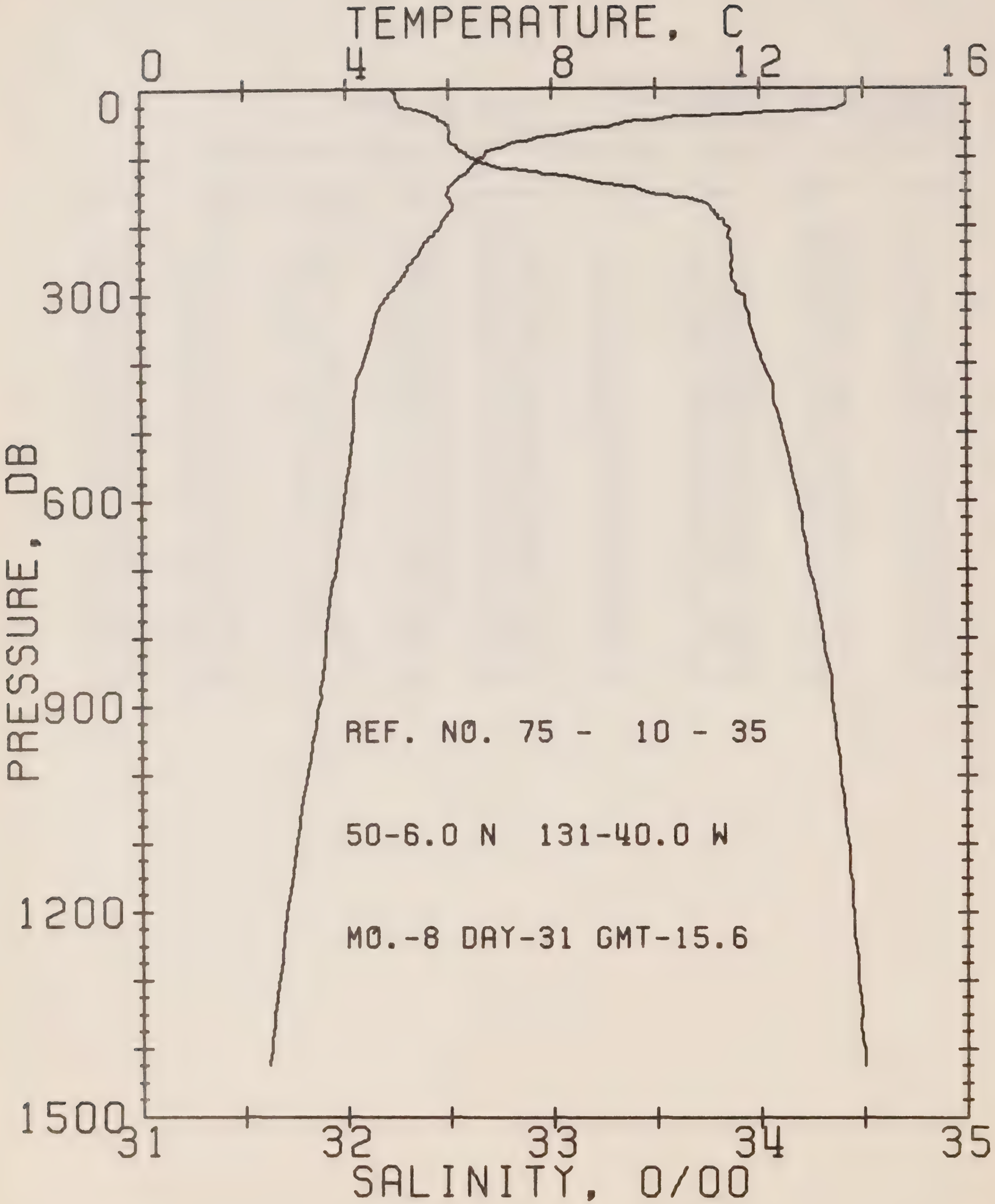
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 33 DATE 30/ 8/75
POSITION 49-51.0N, 128-40.0W GMT 16.0
RESULTS OF STP CAST 346 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.66	31.97	0	23.94	397.5	0.0	0.0	1499.
10	13.66	31.99	10	23.96	396.5	0.40	0.02	1499.
20	12.19	32.04	20	24.28	365.8	0.79	0.08	1495.
30	10.08	32.22	30	24.79	317.0	1.13	0.17	1488.
50	7.72	32.51	50	25.39	260.6	1.70	0.40	1479.
75	6.57	32.79	75	25.76	225.5	2.32	0.79	1476.
100	6.91	33.26	99	26.09	194.7	2.85	1.26	1478.
125	6.92	33.57	124	26.33	172.4	3.31	1.79	1479.
150	6.74	33.72	149	26.47	159.5	3.73	2.37	1479.
175	6.45	33.83	174	26.60	147.7	4.11	3.00	1478.
200	6.21	33.89	199	26.68	140.2	4.47	3.69	1478.
225	5.91	33.92	223	26.74	134.9	4.81	4.43	1477.
250	5.73	33.93	248	26.77	132.2	5.15	5.24	1477.
300	5.48	33.99	298	26.85	125.0	5.79	7.05	1477.
400	4.95	34.06	397	26.96	114.6	6.98	11.28	1476.
500	4.63	34.15	496	27.07	105.8	8.08	16.33	1476.
600	4.30	34.20	595	27.15	98.6	9.11	22.07	1477.
800	3.78	34.32	793	27.29	86.2	10.96	35.24	1478.
1000	3.42	34.39	990	27.39	77.8	12.59	50.18	1480.
1200	3.01	34.45	1188	27.47	70.0	14.07	66.77	1482.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 34
50-2.0 N 130-40.0 W
MO.-8 DAY-31 GMT-11.1
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 34 DATE 31/ 8/75
POSITION 50- 2.0N. 130-40.0W GMT 11.1
RESULTS OF STP CAST 308 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.83	32.12	0	24.02	389.7	0.0	0.0	1500.
10	13.83	32.12	10	24.02	390.2	0.39	0.02	1500.
20	13.78	32.12	20	24.03	389.5	0.78	0.08	1500.
30	13.37	32.21	30	24.19	375.3	1.16	0.18	1499.
50	8.72	32.45	50	25.19	279.6	1.83	0.45	1483.
75	7.00	32.56	75	25.52	248.1	2.47	0.85	1477.
100	6.59	32.59	99	25.60	241.0	3.08	1.40	1476.
125	6.38	32.91	124	25.88	214.4	3.66	2.06	1476.
150	6.20	33.62	149	26.46	159.9	4.12	2.70	1476.
175	6.15	33.78	174	26.59	147.7	4.50	3.33	1477.
200	6.00	33.84	199	26.66	141.7	4.86	4.02	1477.
225	5.64	33.85	223	26.72	136.7	5.21	4.77	1476.
250	5.36	33.86	248	26.75	133.0	5.55	5.59	1475.
300	4.99	33.90	298	26.83	126.3	6.20	7.41	1474.
400	4.61	34.00	397	26.95	115.5	7.39	11.66	1475.
500	4.12	34.07	496	27.06	105.8	8.50	16.72	1474.
600	4.06	34.15	595	27.13	100.0	9.53	22.49	1476.
800	3.59	34.29	793	27.29	85.9	11.38	35.63	1477.
1000	3.20	34.38	990	27.40	76.1	12.99	50.44	1479.
1200	2.84	34.45	1188	27.48	68.4	14.44	66.60	1481.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 75 - 10 - 35
50-6.0 N 131-40.0 W
MO.-8 DAY-31 GMT-15.6
31
32
33
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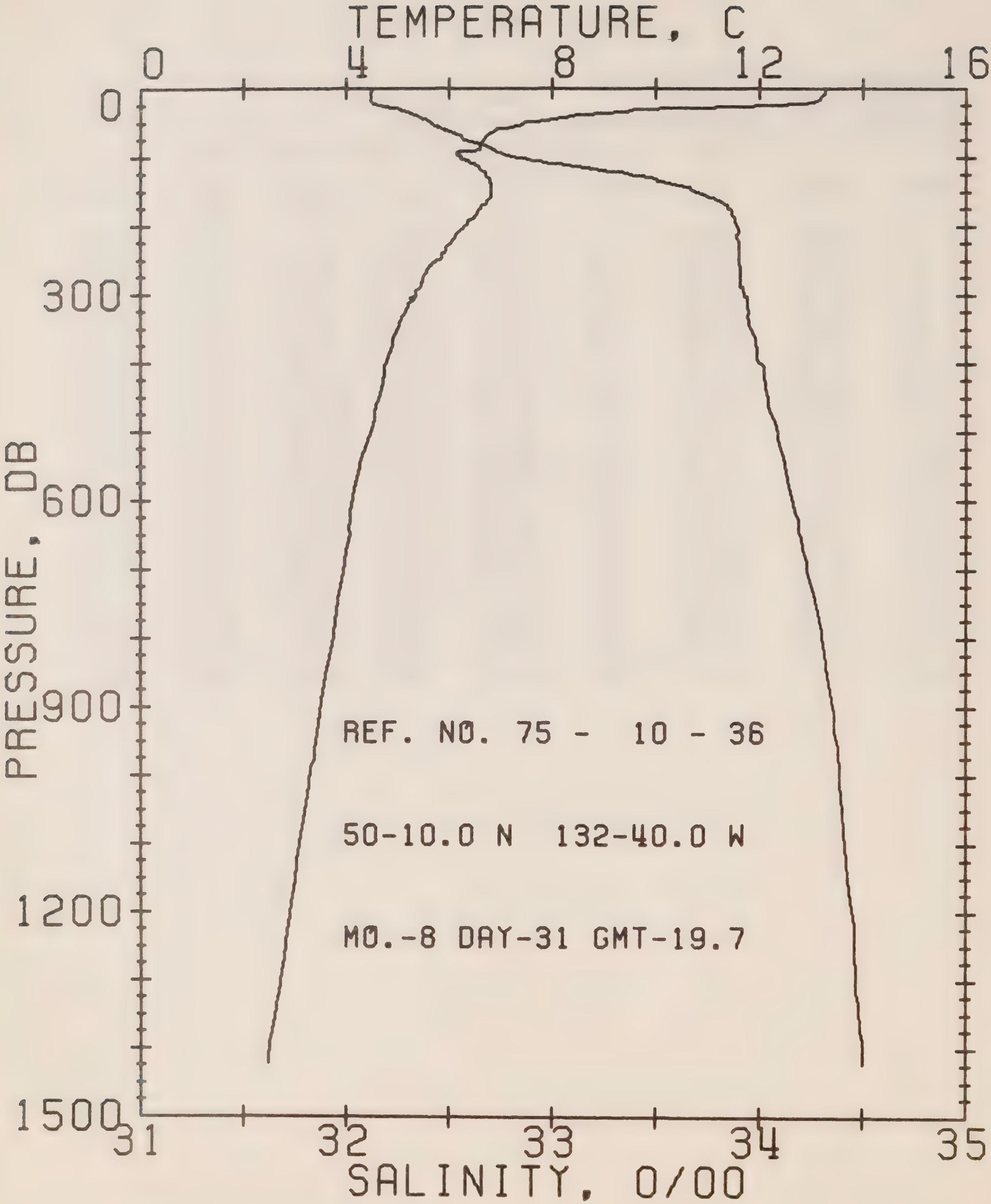
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 35 DATE 31/ 8/75
POSITION 50- 6.0N, 131-40.0W GMT 15.6
RESULTS OF STP CAST 243 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.68	32.23	0	24.14	378.8	0.0	0.0	1500.
10	13.68	32.24	10	24.15	378.5	0.38	0.02	1500.
20	13.68	32.25	20	24.15	378.0	0.76	0.08	1500.
30	13.45	32.34	30	24.27	367.2	1.13	0.17	1500.
50	9.35	32.49	50	25.12	286.0	1.76	0.43	1486.
75	7.52	32.50	75	25.41	259.4	2.44	0.85	1479.
100	6.60	32.62	99	25.62	238.8	3.06	1.41	1476.
125	6.28	33.03	124	25.99	204.7	3.63	2.06	1476.
150	5.98	33.47	149	26.37	168.3	4.09	2.70	1475.
175	6.07	33.77	174	26.60	147.4	4.48	3.34	1477.
200	5.83	33.85	199	26.69	139.1	4.83	4.02	1476.
225	5.52	33.86	223	26.74	134.6	5.18	4.76	1475.
250	5.30	33.87	248	26.77	131.6	5.51	5.57	1475.
300	4.81	33.92	298	26.86	123.0	6.15	7.38	1474.
400	4.32	34.01	397	26.99	111.3	7.32	11.53	1473.
500	4.11	34.11	496	27.09	102.9	8.38	16.40	1474.
600	3.95	34.18	595	27.17	96.4	9.38	21.97	1475.
800	3.57	34.30	793	27.30	84.8	11.19	34.87	1477.
1000	3.21	34.38	990	27.40	76.1	12.80	49.62	1479.
1200	2.81	34.45	1188	27.49	68.3	14.24	65.72	1481.


TEMPERATURE, C
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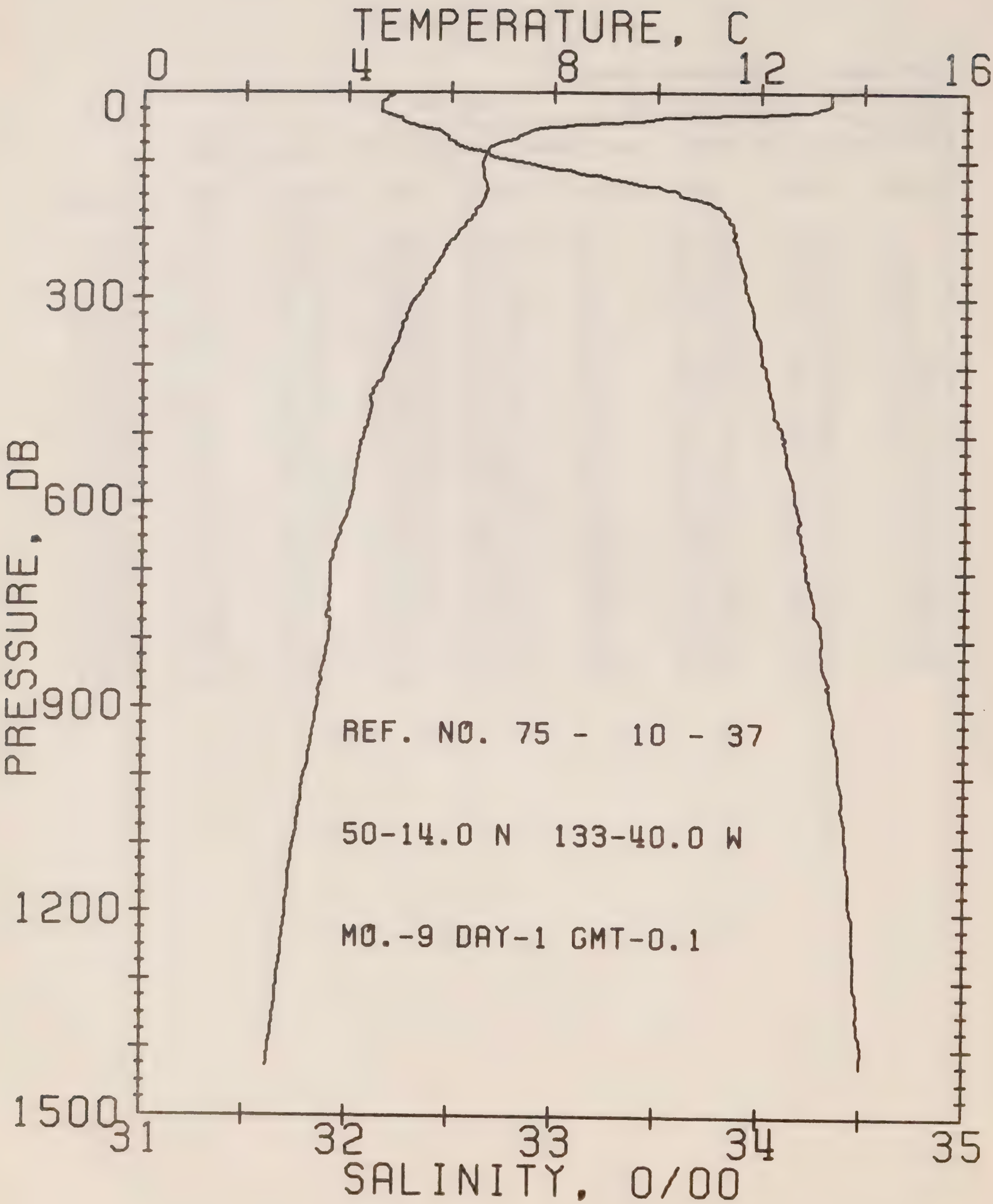
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 36
50-10.0 N 132-40.0 W
MO.-8 DAY-31 GMT-19.7
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 36 DATE 31/ 8/75
POSITION 50-10.0N, 132-40.0W GMT 19.7
RESULTS OF STP CAST 224 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.27	32.12	0	24.14	379.0	0.0	0.0	1498.
10	13.21	32.12	10	24.15	378.5	0.38	0.02	1498.
20	13.07	32.13	20	24.18	375.2	0.76	0.08	1498.
30	9.61	32.27	30	24.91	306.0	1.10	0.16	1486.
50	7.47	32.42	50	25.35	264.3	1.67	0.39	1478.
75	6.66	32.60	75	25.60	240.8	2.29	0.79	1476.
100	6.22	32.85	99	25.86	216.6	2.87	1.30	1475.
125	6.73	33.40	124	26.22	182.7	3.37	1.87	1478.
150	6.84	33.71	149	26.45	161.3	3.79	2.47	1479.
175	6.58	33.86	174	26.60	147.0	4.18	3.10	1479.
200	6.31	33.89	199	26.66	141.7	4.54	3.79	1478.
225	6.01	33.90	223	26.71	137.6	4.89	4.55	1477.
250	5.76	33.90	248	26.74	134.9	5.23	5.37	1477.
300	5.36	33.93	298	26.81	128.4	5.88	7.21	1476.
400	4.76	34.01	397	26.94	116.4	7.11	11.57	1475.
500	4.48	34.09	496	27.04	108.2	8.23	16.74	1476.
600	4.12	34.16	595	27.13	100.2	9.28	22.57	1476.
800	3.74	34.30	793	27.28	86.6	11.14	35.80	1478.
1000	3.29	34.39	990	27.40	76.7	12.77	50.71	1479.
1200	2.91	34.45	1188	27.48	69.2	14.23	67.12	1481.


TEMPERATURE, C
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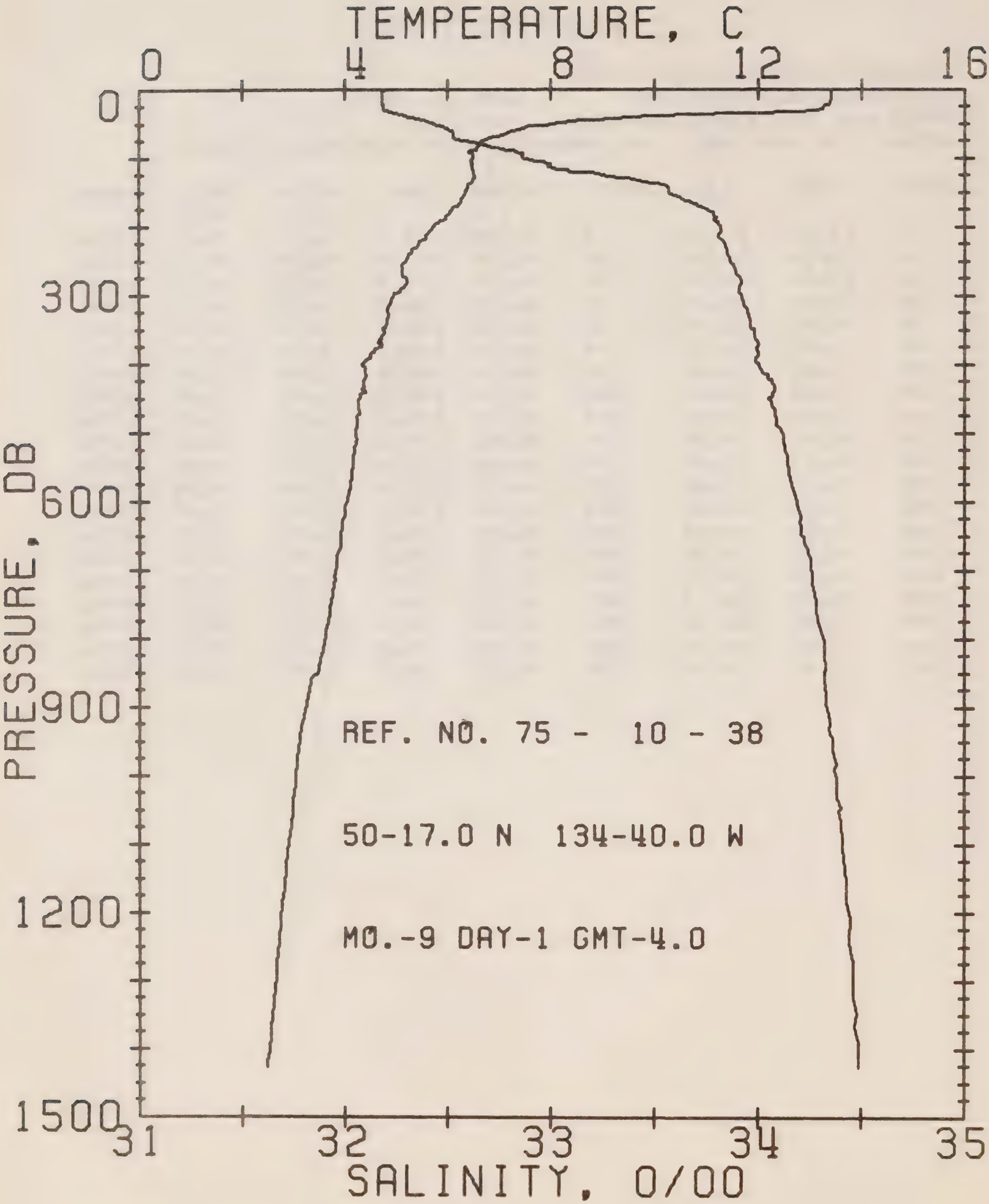
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 37
50-14.0 N 133-40.0 W
MO.-9 DAY-1 GMT-0.1
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 37 DATE 1/ 9/75
POSITION 50-14.0N, 133-40.0W GMT 0.1
RESULTS OF STP CAST 363 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.36	32.21	0	24.19	374.1	0.0	0.0	1499.
10	13.36	32.18	10	24.17	376.5	0.37	0.02	1499.
20	13.29	32.16	20	24.16	377.2	0.75	0.08	1499.
30	12.28	32.19	30	24.38	356.5	1.12	0.17	1495.
50	8.01	32.36	50	25.23	276.1	1.74	0.42	1480.
75	6.88	32.53	75	25.52	248.8	2.39	0.83	1477.
100	6.62	32.84	99	25.79	222.7	2.98	1.36	1476.
125	6.66	33.28	124	26.13	190.7	3.50	1.95	1477.
150	6.66	33.62	149	26.40	165.7	3.94	2.56	1478.
175	6.48	33.82	174	26.59	148.5	4.32	3.20	1478.
200	6.19	33.87	199	26.66	141.8	4.69	3.90	1478.
225	5.93	33.89	223	26.71	137.4	5.04	4.65	1477.
250	5.72	33.90	248	26.75	134.1	5.38	5.47	1477.
300	5.33	33.94	298	26.82	127.3	6.03	7.30	1476.
400	4.74	34.02	397	26.95	115.4	7.24	11.61	1475.
500	4.32	34.11	496	27.07	105.0	8.34	16.65	1475.
600	4.05	34.17	595	27.15	98.0	9.35	22.33	1476.
800	3.65	34.31	793	27.30	85.1	11.17	35.27	1478.
1000	3.16	34.39	990	27.41	75.2	12.78	49.96	1479.
1200	2.82	34.45	1188	27.49	68.3	14.21	65.94	1481.


TEMPERATURE, C
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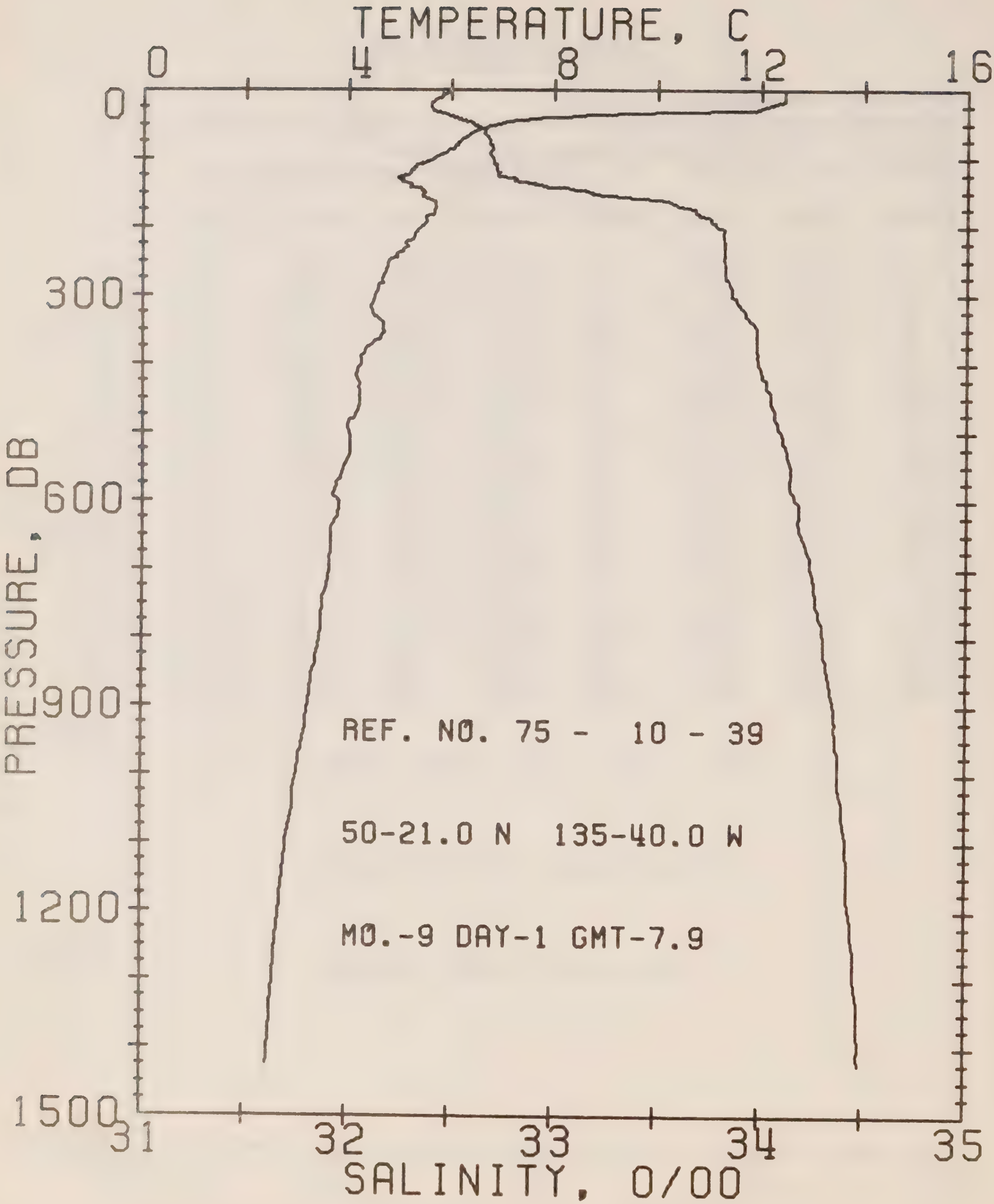
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 38
50-17.0 N 134-40.0 W
MO.-9 DAY-1 GMT-4.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 38 DATE 1/ 9/75
POSITION 50-17.0N, 134-40.0W GMT 4.0
RESULTS OF STP CAST 341 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.40	32.18	0	24.16	377.1	0.0	0.0	1499.
10	13.41	32.18	10	24.15	377.7	0.38	0.02	1499.
20	13.38	32.18	20	24.16	377.4	0.76	0.08	1499.
30	13.18	32.20	30	24.22	372.4	1.13	0.17	1498.
50	7.97	32.44	50	25.30	269.3	1.74	0.42	1480.
75	6.66	32.60	75	25.60	240.5	2.38	0.82	1476.
100	6.49	32.87	99	25.83	218.8	2.94	1.32	1476.
125	6.53	33.28	124	26.15	189.0	3.46	1.91	1477.
150	6.34	33.57	149	26.40	165.4	3.89	2.51	1477.
175	6.07	33.76	174	26.59	148.2	4.28	3.16	1477.
200	5.70	33.82	199	26.68	139.5	4.64	3.85	1476.
225	5.42	33.84	223	26.73	135.0	4.98	4.60	1475.
250	5.17	33.87	248	26.78	130.3	5.32	5.40	1474.
300	4.94	33.92	298	26.85	124.2	5.95	7.18	1474.
400	4.35	34.00	397	26.98	112.6	7.14	11.40	1474.
500	4.21	34.12	496	27.09	103.4	8.21	16.33	1475.
600	4.04	34.19	595	27.16	96.9	9.22	21.97	1476.
800	3.61	34.32	793	27.31	84.2	11.03	34.86	1477.
1000	3.04	34.38	990	27.41	74.8	12.62	49.39	1478.
1200	2.76	34.44	1188	27.49	68.1	14.05	65.42	1481.


TEMPERATURE, C
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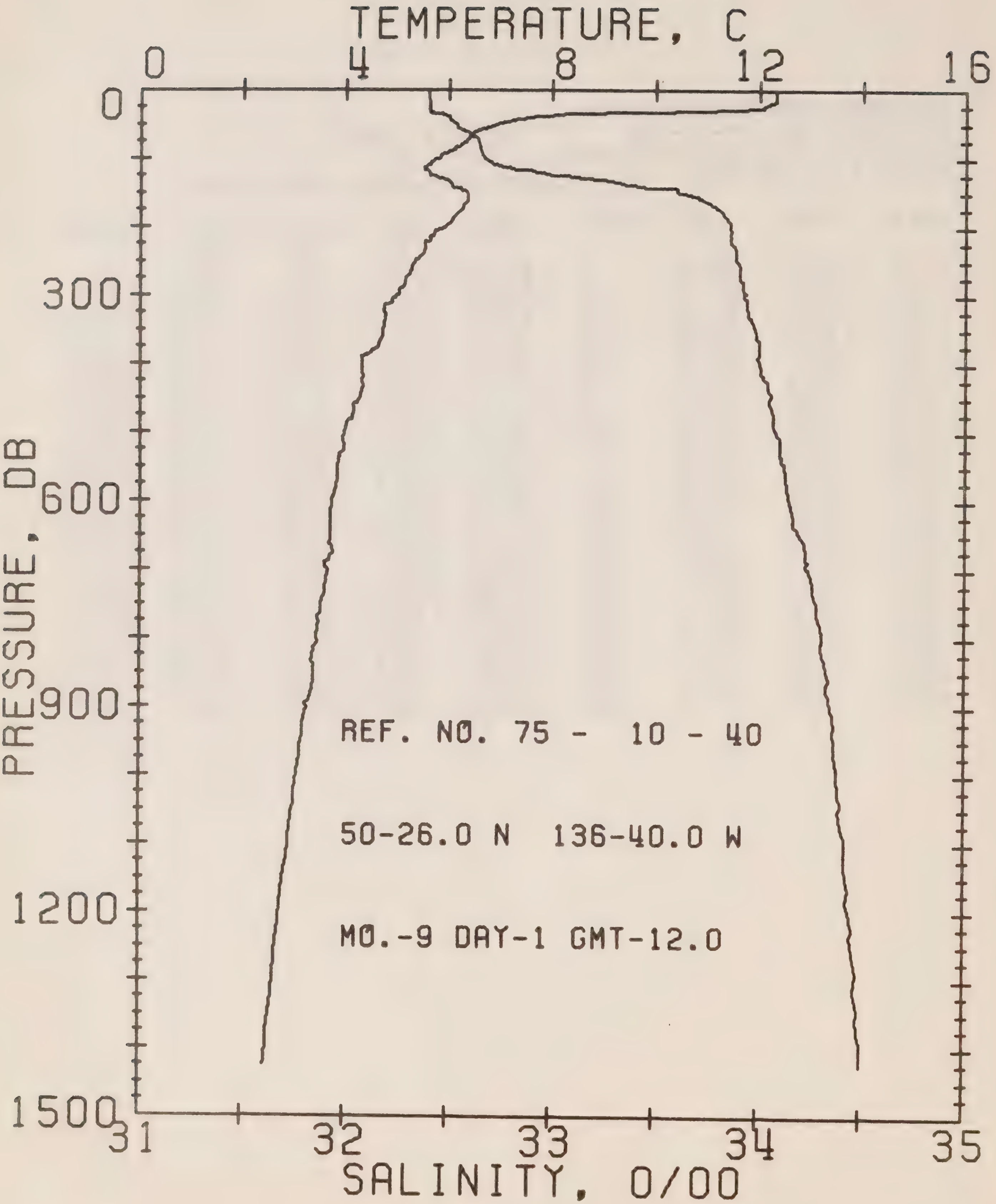
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 39
50-21.0 N 135-40.0 W
MO.-9 DAY-1 GMT-7.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 39 DATE 1/ 9/75
POSITION 50-21.0N. 135-40.0W GMT 7.9
RESULTS OF STP CAST 313 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.46	32.50	0	24.59	336.1	0.0	0.0	1496.
10	12.46	32.45	10	24.55	340.2	0.34	0.02	1496.
20	12.25	32.40	20	24.55	340.3	0.68	0.07	1495.
30	11.63	32.42	30	24.68	328.1	1.02	0.16	1493.
50	6.87	32.61	50	25.58	242.0	1.55	0.37	1476.
75	6.16	32.69	75	25.73	227.9	2.13	0.74	1474.
100	5.65	32.70	99	25.80	221.5	2.70	1.24	1472.
125	5.02	32.74	124	25.91	211.6	3.24	1.86	1470.
150	5.48	33.18	149	26.21	183.7	3.73	2.56	1473.
175	5.69	33.68	174	26.57	149.5	4.14	3.23	1475.
200	5.41	33.79	199	26.69	138.2	4.50	3.92	1474.
225	5.16	33.82	223	26.75	133.2	4.84	4.65	1474.
250	4.87	33.84	248	26.79	129.1	5.17	5.44	1473.
300	4.54	33.86	298	26.85	124.2	5.80	7.22	1472.
400	4.25	33.99	397	26.98	112.3	6.97	11.39	1473.
500	4.04	34.10	496	27.09	102.6	8.05	16.32	1474.
600	3.83	34.17	595	27.17	95.6	9.04	21.86	1475.
800	3.46	34.31	793	27.31	83.3	10.82	34.55	1477.
1000	3.01	34.38	990	27.41	74.3	12.39	48.91	1478.
1200	2.69	34.44	1188	27.49	67.5	13.80	64.71	1480.


TEMPERATURE, C
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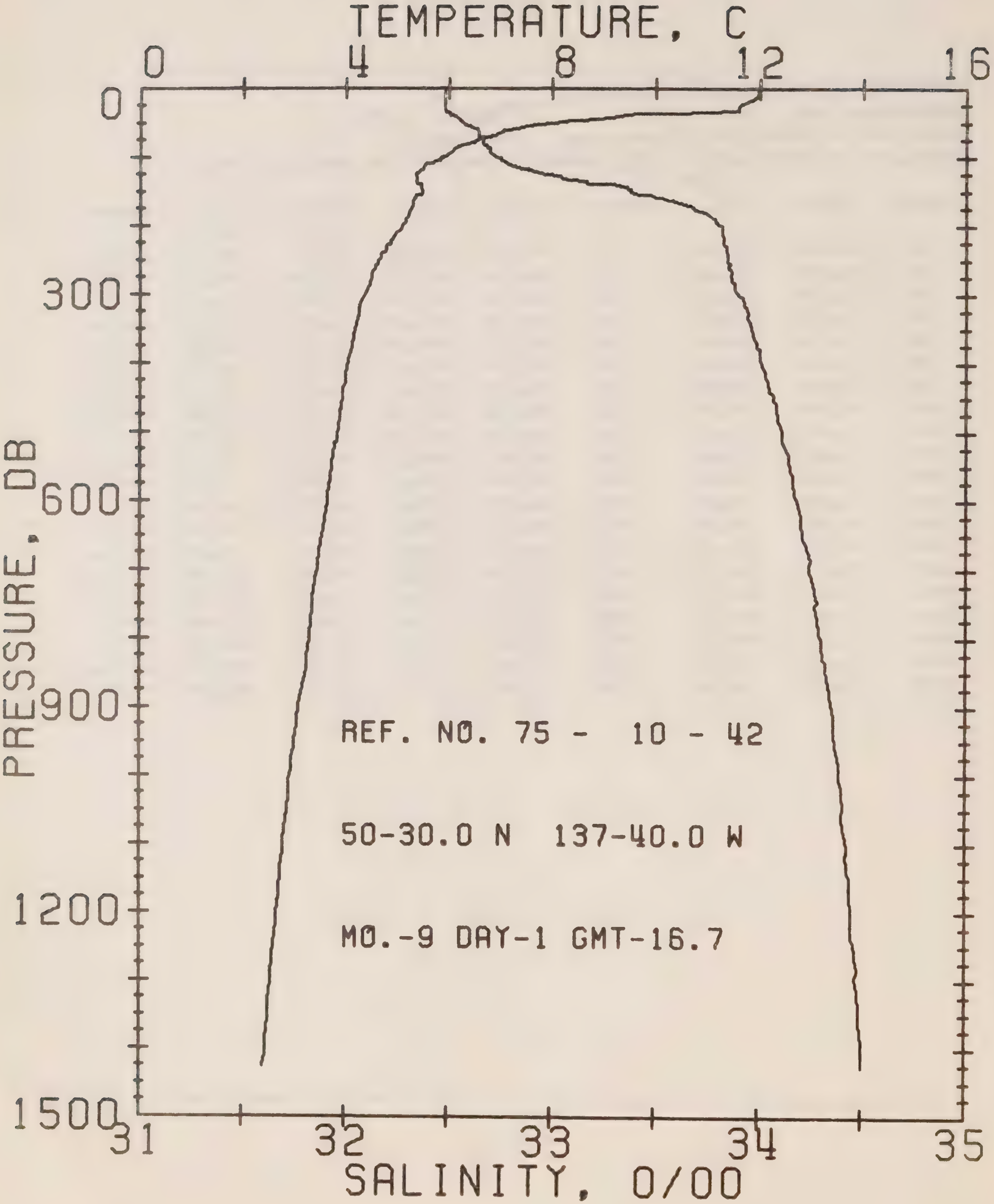
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 40
50-26.0 N 136-40.0 W
MO.-9 DAY-1 GMT-12.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 40 DATE 1/ 9/75
POSITION 50-26.0N. 136-40.0W GMT 12.0
RESULTS OF STP CAST 351 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.32	32.40	0	24.54	340.9	0.0	0.0	1495.
10	12.32	32.40	10	24.54	341.4	0.34	0.02	1495.
20	12.14	32.41	20	24.58	337.6	0.68	0.07	1495.
30	10.02	32.41	30	24.95	301.9	1.01	0.15	1488.
50	6.92	32.54	50	25.52	248.5	1.54	0.37	1476.
75	6.31	32.64	75	25.68	233.5	2.13	0.75	1474.
100	5.76	32.68	99	25.78	224.2	2.70	1.25	1473.
125	5.74	33.09	124	26.10	193.6	3.23	1.86	1474.
150	6.35	33.63	149	26.45	161.0	3.67	2.47	1477.
175	6.22	33.81	174	26.61	146.1	4.05	3.10	1477.
200	5.88	33.86	199	26.69	138.7	4.41	3.78	1476.
225	5.54	33.88	223	26.75	133.4	4.75	4.52	1475.
250	5.33	33.89	248	26.79	130.1	5.08	5.31	1475.
300	4.97	33.93	298	26.86	123.9	5.71	7.09	1474.
400	4.33	34.00	397	26.98	112.3	6.89	11.28	1473.
500	3.97	34.08	496	27.08	103.1	7.97	16.22	1474.
600	3.74	34.15	595	27.16	96.5	8.96	21.80	1474.
800	3.45	34.31	793	27.32	83.0	10.75	34.52	1477.
1000	3.06	34.38	990	27.41	74.8	12.33	48.93	1478.
1200	2.74	34.44	1188	27.49	67.7	13.75	64.86	1480.


TEMPERATURE, C
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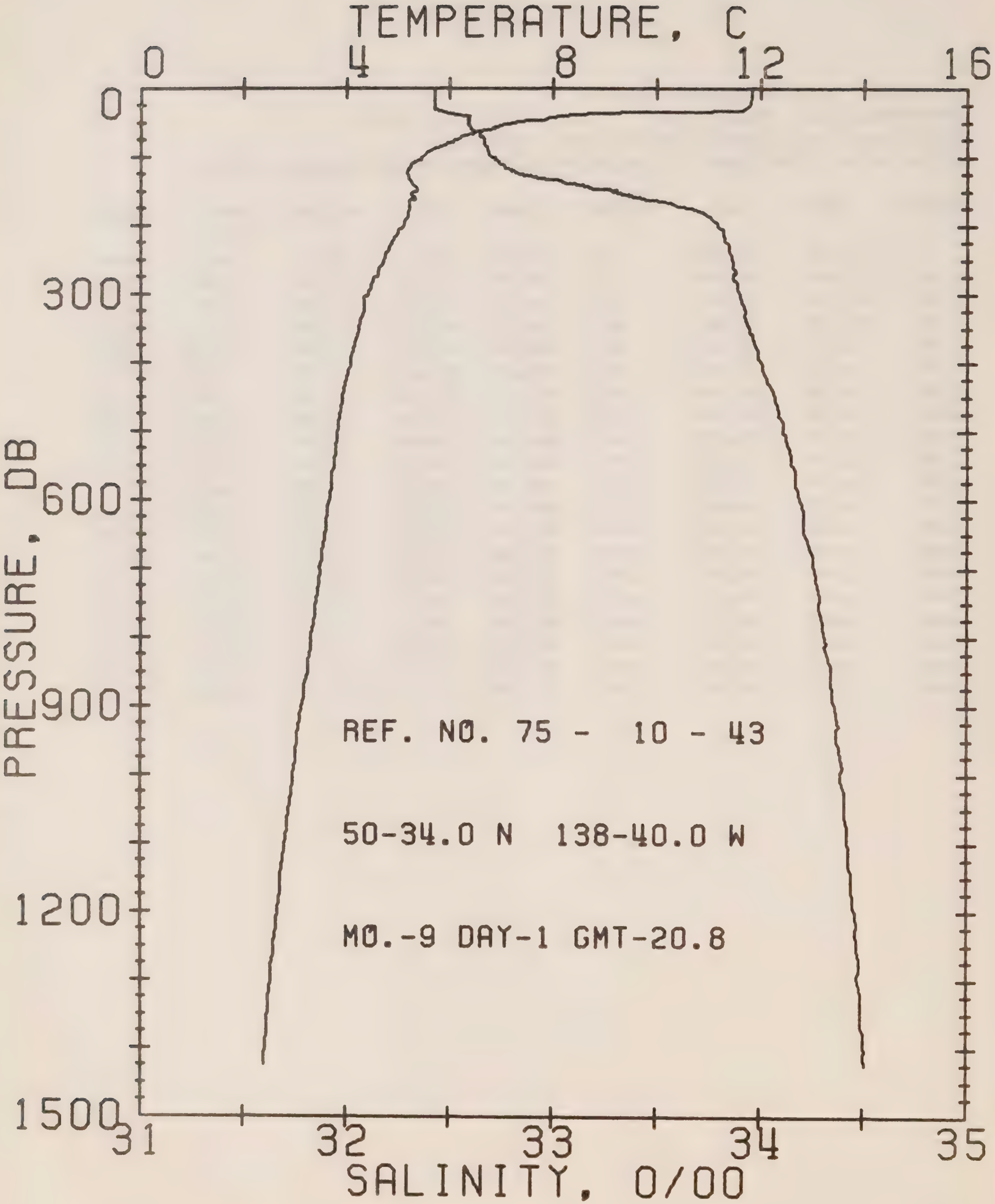
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 42
50-30.0 N 137-40.0 W
MO.-9 DAY-1 GMT-16.7
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 42 DATE 1/ 9/75
POSITION 50-30.0N. 137-40.0W GMT 16.7
RESULTS OF STP CAST 328 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.96	32.48	0	24.67	328.6	0.0	0.0	1494.
10	11.97	32.48	10	24.66	329.2	0.33	0.02	1494.
20	11.76	32.48	20	24.70	325.7	0.66	0.07	1494.
30	11.59	32.48	30	24.73	323.0	0.98	0.15	1493.
50	7.92	32.58	50	25.41	258.7	1.55	0.38	1480.
75	6.51	32.67	75	25.67	233.7	2.16	0.77	1475.
100	5.89	32.74	99	25.81	221.3	2.73	1.27	1473.
125	5.35	33.03	124	26.10	193.6	3.25	1.87	1472.
150	5.49	33.38	149	26.36	169.2	3.70	2.50	1473.
175	5.26	33.69	174	26.63	143.8	4.09	3.14	1473.
200	5.09	33.82	199	26.75	132.3	4.43	3.79	1473.
225	4.85	33.83	223	26.79	129.1	4.76	4.50	1473.
250	4.65	33.85	248	26.83	125.7	5.07	5.27	1472.
300	4.35	33.90	298	26.90	119.2	5.69	6.99	1472.
400	4.02	34.01	397	27.02	108.5	6.82	11.01	1472.
500	3.84	34.11	496	27.12	99.7	7.86	15.77	1473.
600	3.65	34.18	595	27.20	93.1	8.82	21.16	1474.
800	3.30	34.30	793	27.32	82.1	10.56	33.56	1476.
1000	2.93	34.39	990	27.43	72.7	12.10	47.67	1478.
1200	2.67	34.45	1188	27.50	66.5	13.50	63.25	1480.


TEMPERATURE, C
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8
12
16
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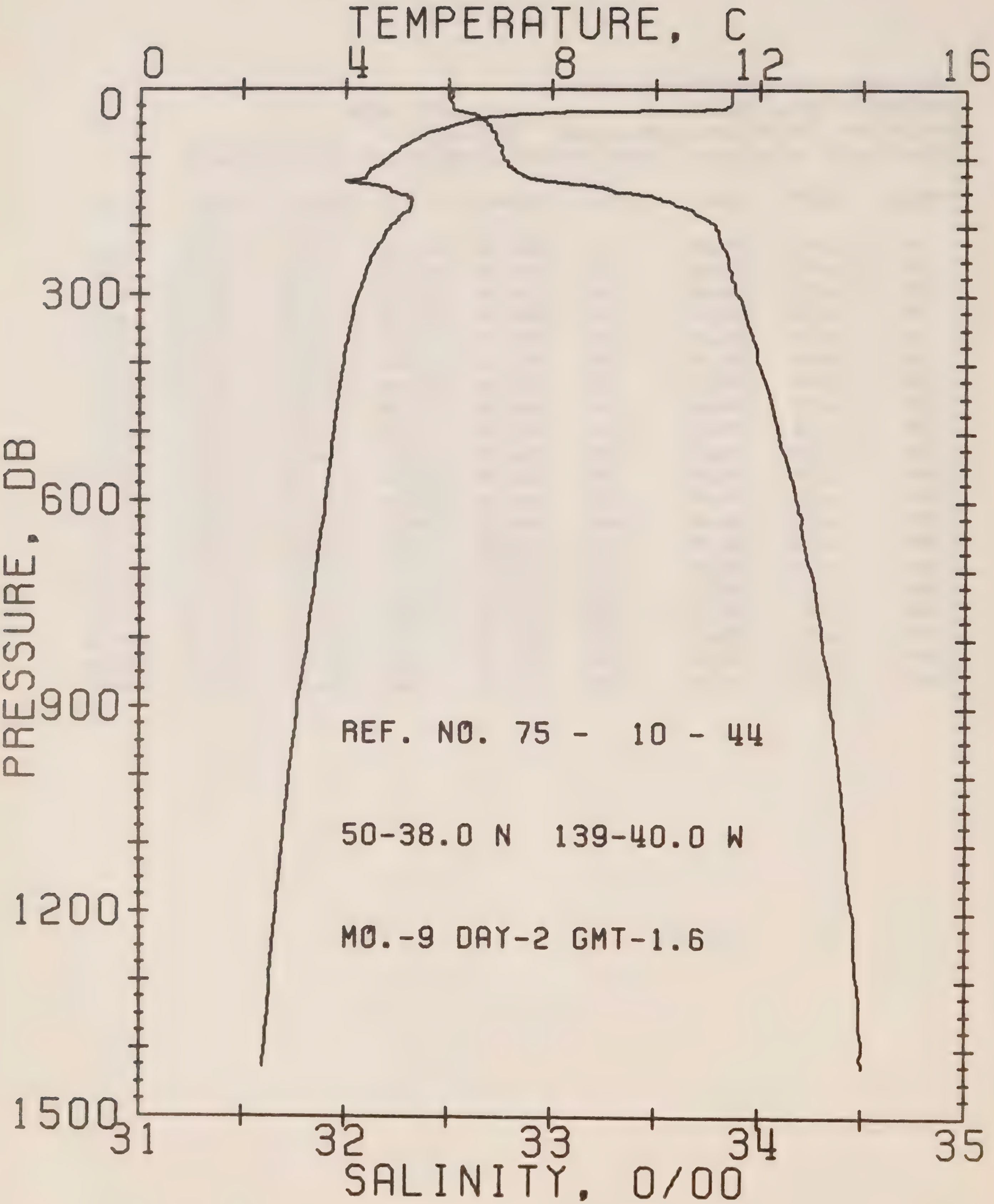
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 43
50-34.0 N 138-40.0 W
MO.-9 DAY-1 GMT-20.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 43 DATE 1/ 9/75
POSITION 50-34.0N, 138-40.0W GMT 20.8
RESULTS OF STP CAST 330 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.83	32.43	0	24.65	329.9	0.0	0.0	1494.
10	11.83	32.43	10	24.65	330.4	0.33	0.02	1494.
20	11.81	32.43	20	24.65	330.2	0.66	0.07	1494.
30	11.69	32.44	30	24.68	327.6	0.99	0.15	1494.
50	7.25	32.60	50	25.52	248.1	1.53	0.37	1478.
75	6.09	32.67	75	25.73	228.6	2.13	0.75	1474.
100	5.44	32.71	99	25.84	218.0	2.69	1.24	1471.
125	5.19	32.88	124	26.00	203.0	3.22	1.85	1471.
150	5.36	33.29	149	26.30	174.5	3.69	2.51	1473.
175	5.22	33.68	174	26.63	144.2	4.08	3.17	1473.
200	5.10	33.80	199	26.74	134.1	4.43	3.83	1473.
225	4.87	33.84	223	26.80	128.6	4.76	4.54	1473.
250	4.72	33.86	248	26.83	125.7	5.07	5.30	1472.
300	4.43	33.90	298	26.89	120.1	5.69	7.02	1472.
400	4.08	34.00	397	27.01	109.3	6.84	11.11	1472.
500	3.82	34.11	496	27.12	99.6	7.87	15.86	1473.
600	3.66	34.19	595	27.20	92.6	8.83	21.22	1474.
800	3.31	34.31	793	27.33	81.2	10.57	33.56	1476.
1000	2.97	34.39	990	27.43	73.0	12.10	47.58	1478.
1200	2.66	34.46	1188	27.51	65.9	13.48	63.12	1480.


TEMPERATURE, C
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8
12
16
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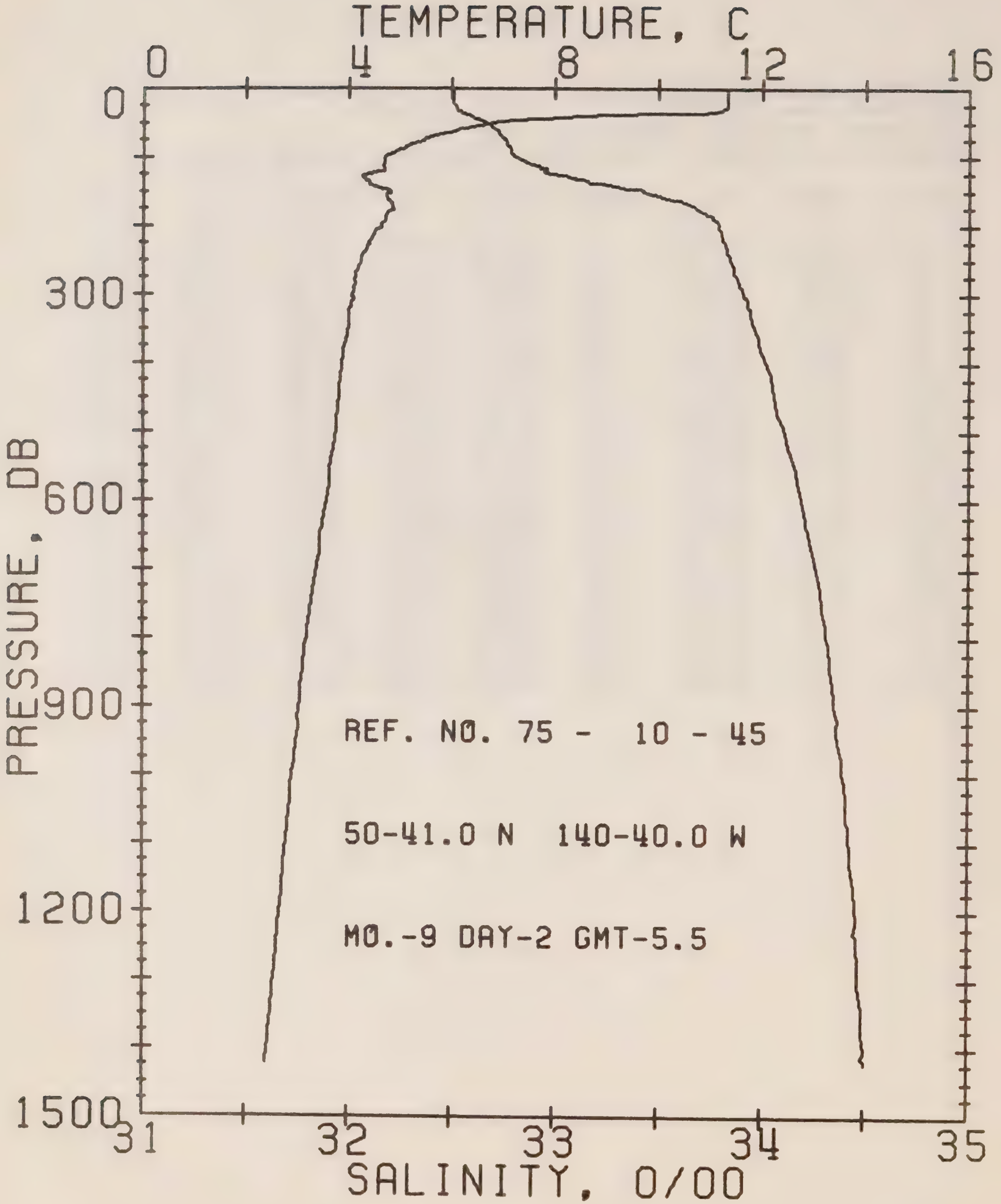
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 44
50-38.0 N 139-40.0 W
MO.-9 DAY-2 GMT-1.6
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 44 DATE 2/ 9/75
POSITION 50-38.0N. 139-40.0W GMT 1.6
RESULTS OF STP CAST 219 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.47	32.52	0	24.79	317.0	0.0	0.0	1492.
10	11.47	32.52	10	24.79	317.5	0.32	0.02	1493.
20	11.45	32.52	20	24.79	317.6	0.64	0.06	1493.
30	10.20	32.54	30	25.02	295.2	0.95	0.14	1488.
50	6.22	32.69	50	25.73	228.4	1.44	0.34	1474.
75	5.33	32.73	75	25.87	215.1	1.99	0.69	1471.
100	4.84	32.77	99	25.95	207.3	2.52	1.16	1469.
125	4.41	32.86	124	26.07	196.3	3.02	1.74	1468.
150	4.91	33.30	149	26.36	168.7	3.47	2.37	1471.
175	5.24	33.67	174	26.62	144.7	3.85	3.00	1473.
200	4.89	33.79	199	26.75	132.3	4.20	3.66	1472.
225	4.67	33.81	223	26.80	128.4	4.52	4.37	1472.
250	4.48	33.85	248	26.85	123.9	4.84	5.13	1471.
300	4.25	33.90	298	26.91	118.1	5.45	6.83	1471.
400	3.96	33.99	397	27.02	108.9	6.57	10.84	1472.
500	3.77	34.09	496	27.11	100.3	7.61	15.61	1473.
600	3.61	34.18	595	27.20	92.9	8.58	21.00	1474.
800	3.26	34.30	793	27.33	81.3	10.31	33.33	1476.
1000	2.92	34.39	990	27.43	72.5	11.84	47.36	1478.
1200	2.65	34.46	1188	27.51	65.9	13.23	62.91	1480.


TEMPERATURE, C
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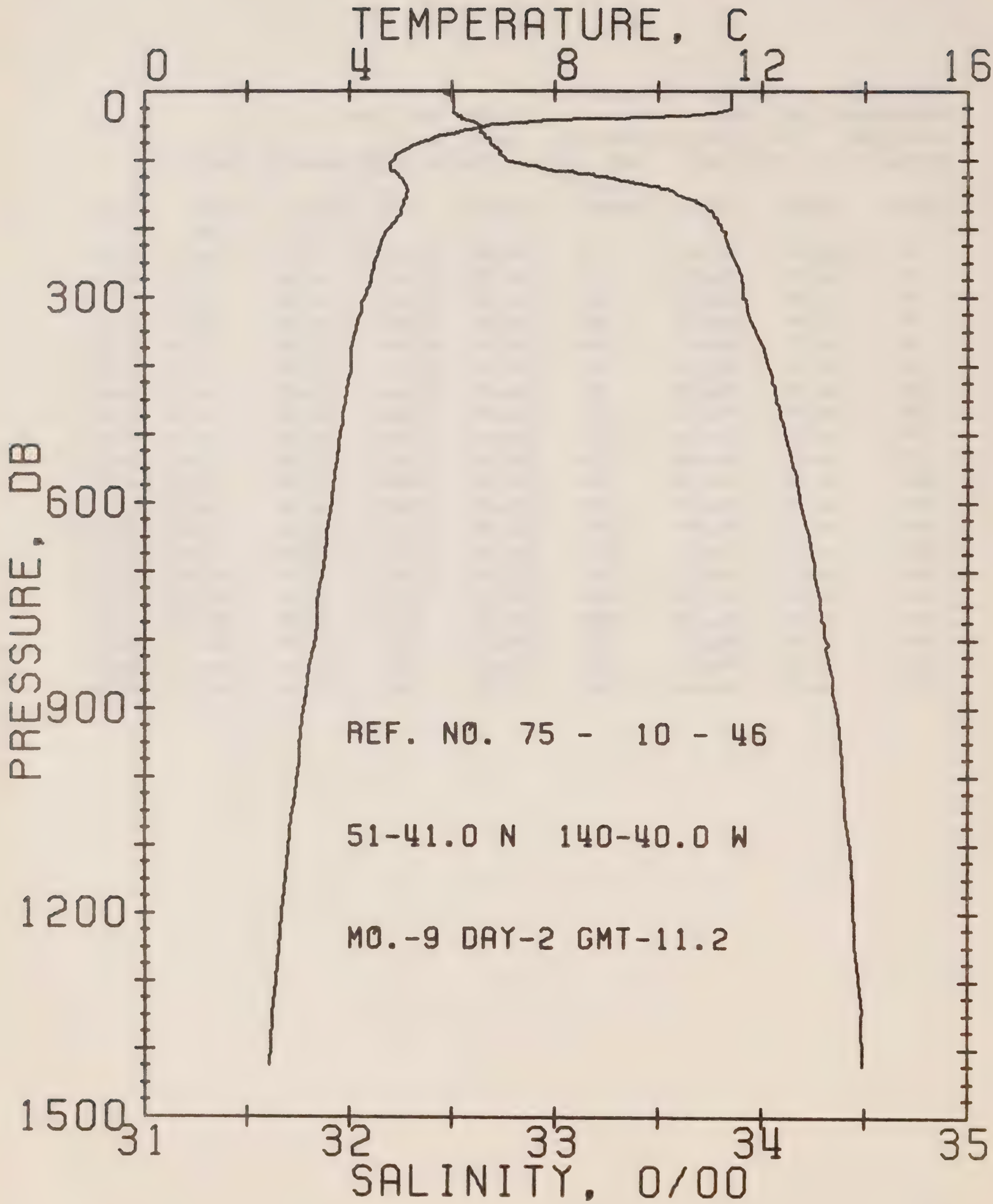
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 45
50-41.0 N 140-40.0 W
MO.-9 DAY-2 GMT-5.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 45   DATE 2/ 9/75
POSITION 50-41.0N, 140-40.0W   GMT 5.5
RESULTS OF STP CAST   245 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.34	32.51	0	24.80	315.6	0.0	0.0	1492.
10	11.34	32.51	10	24.80	316.0	0.32	0.02	1492.
20	11.34	32.51	20	24.80	316.2	0.63	0.06	1492.
30	11.24	32.53	30	24.84	313.2	0.95	0.14	1492.
50	6.77	32.67	50	25.64	236.4	1.49	0.36	1476.
75	5.46	32.76	75	25.87	214.5	2.05	0.72	1471.
100	4.71	32.82	99	26.00	202.5	2.57	1.18	1469.
125	4.33	33.02	124	26.20	183.4	3.06	1.74	1468.
150	4.82	33.43	149	26.48	158.0	3.48	2.33	1471.
175	4.87	33.68	174	26.67	139.7	3.85	2.94	1472.
200	4.63	33.79	199	26.78	129.5	4.18	3.58	1471.
225	4.42	33.82	223	26.83	125.2	4.50	4.26	1471.
250	4.23	33.84	248	26.87	121.9	4.81	5.01	1470.
300	4.06	33.91	298	26.94	115.4	5.40	6.67	1471.
400	3.87	34.02	397	27.04	106.3	6.51	10.62	1472.
500	3.74	34.10	496	27.13	99.0	7.54	15.32	1473.
600	3.56	34.19	595	27.21	91.7	8.49	20.65	1474.
800	3.18	34.31	793	27.34	79.9	10.19	32.78	1476.
1000	2.91	34.39	990	27.43	72.4	11.72	46.71	1478.
1200	2.67	34.46	1188	27.51	66.1	13.10	62.16	1480.


TEMPERATURE, C
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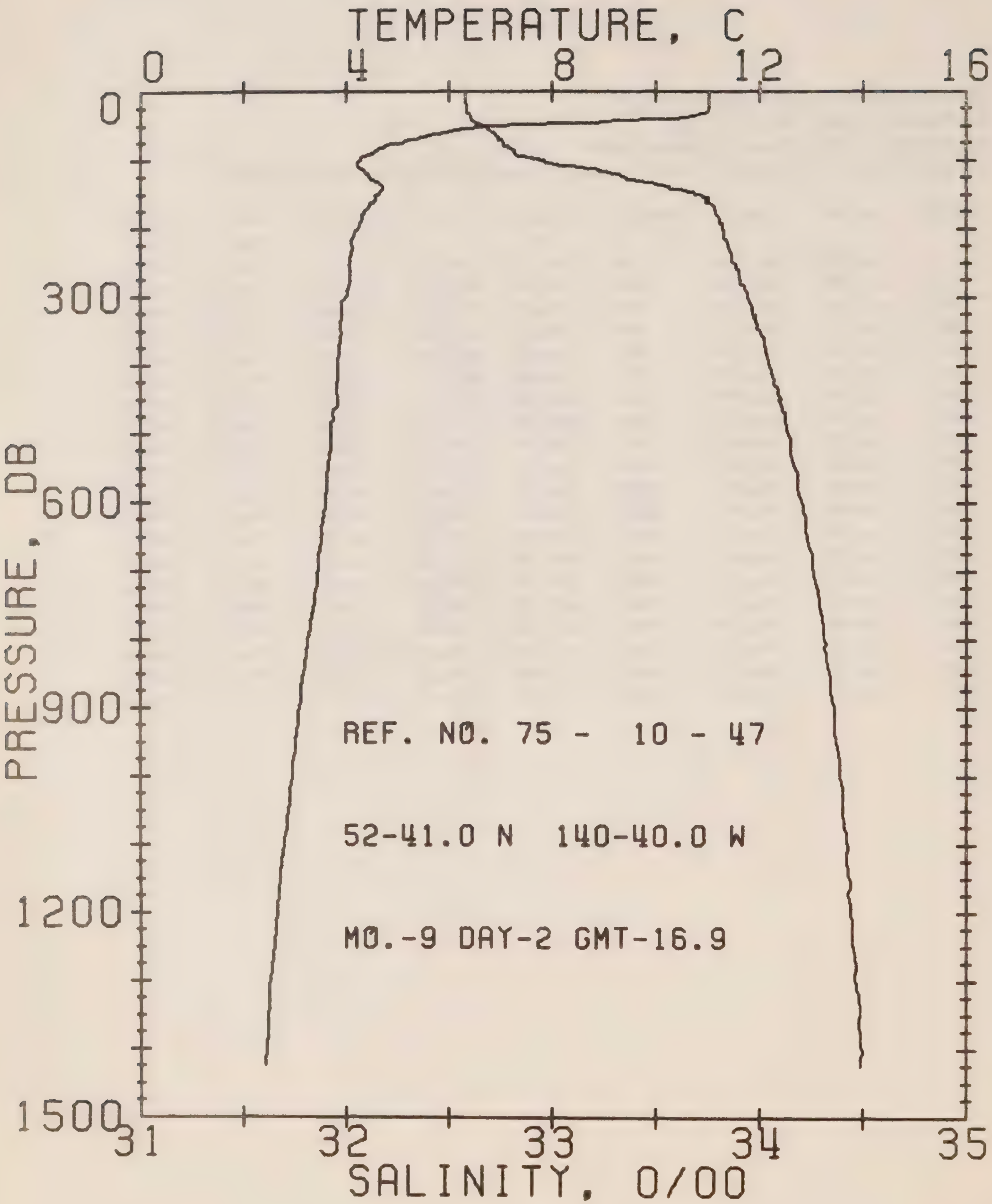
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 75 - 10 - 46
51-41.0 N 140-40.0 W
MO.-9 DAY-2 GMT-11.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 46 DATE 2/ 9/75
POSITION 51-41.0N, 140-40.0W GMT 11.2
RESULTS OF STP CAST 198 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.40	32.46	0	24.75	320.3	0.0	0.0	1492.
10	11.40	32.51	10	24.79	317.0	0.32	0.02	1492.
20	11.40	32.51	20	24.79	317.2	0.64	0.06	1493.
30	11.15	32.51	30	24.84	313.2	0.95	0.15	1492.
50	6.70	32.64	50	25.63	237.9	1.50	0.37	1476.
75	5.36	32.69	75	25.83	218.7	2.07	0.73	1471.
100	4.86	32.77	99	25.95	207.5	2.60	1.20	1469.
125	5.00	33.25	124	26.31	173.2	3.08	1.75	1471.
150	5.13	33.59	149	26.57	149.5	3.48	2.30	1472.
175	5.02	33.75	174	26.71	136.3	3.83	2.89	1472.
200	4.77	33.81	199	26.78	129.7	4.16	3.52	1472.
225	4.60	33.84	223	26.82	125.9	4.48	4.21	1471.
250	4.48	33.87	248	26.86	122.1	4.79	4.96	1471.
300	4.30	33.91	298	26.91	117.9	5.39	6.64	1472.
400	4.03	34.03	397	27.04	106.9	6.51	10.62	1472.
500	3.81	34.11	496	27.12	99.2	7.54	15.34	1473.
600	3.64	34.18	595	27.20	93.0	8.50	20.70	1474.
800	3.32	34.31	793	27.33	81.5	10.23	33.02	1476.
1000	2.98	34.39	990	27.43	73.1	11.76	47.03	1478.
1200	2.66	34.44	1188	27.49	67.1	13.15	62.62	1480.


TEMPERATURE, C
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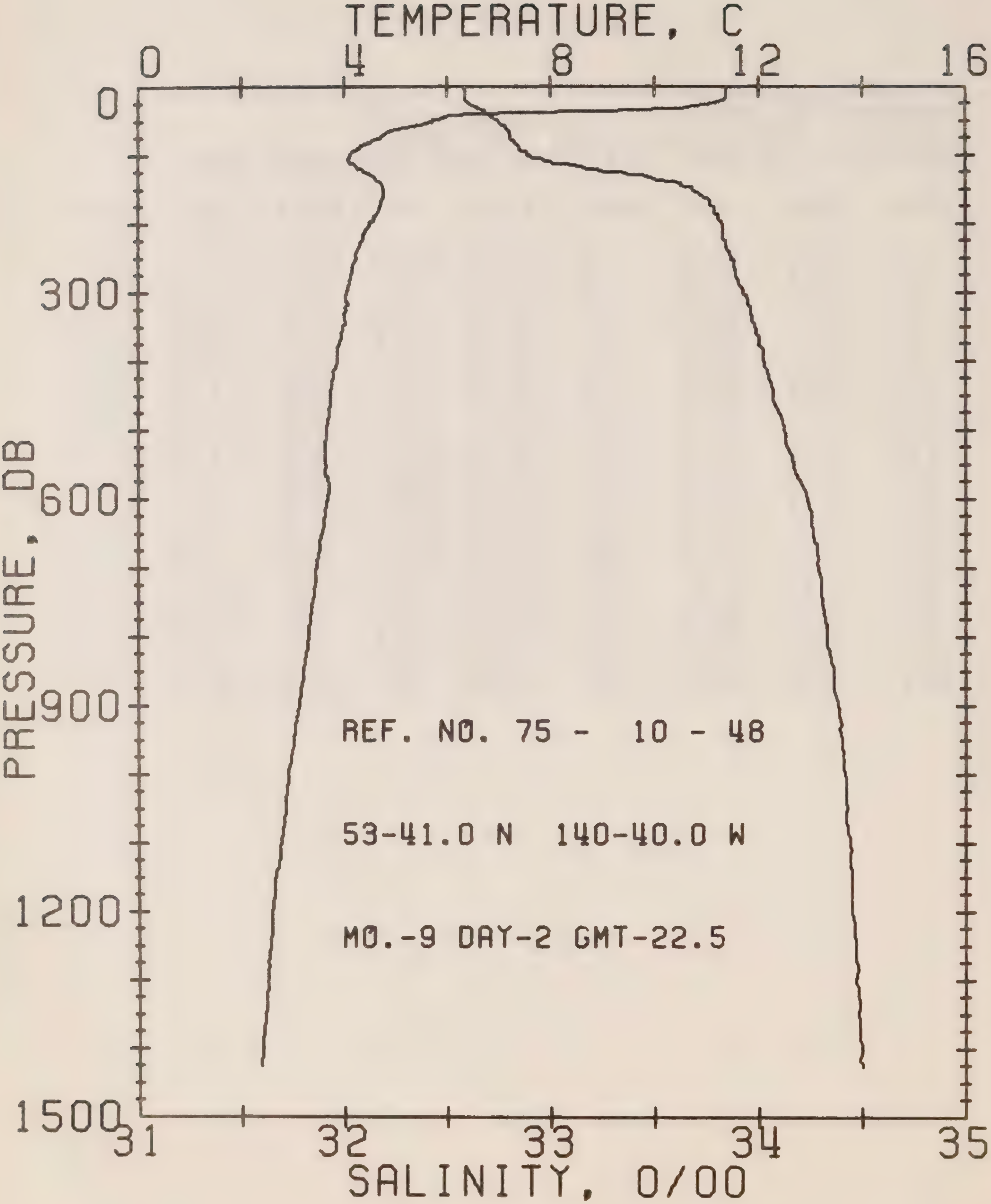
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 47
52-41.0 N 140-40.0 W
MO.-9 DAY-2 GMT-16.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 47 DATE 2/ 9/75
POSITION 52-41.0N, 140-40.0W GMT 16.9
RESULTS OF STP CAST 344 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.04	32.58	0	24.91	305.3	0.0	0.0	1491.
10	11.04	32.58	10	24.91	305.7	0.31	0.02	1491.
20	11.03	32.59	20	24.92	305.3	0.61	0.06	1491.
30	10.97	32.59	30	24.93	303.9	0.92	0.14	1491.
50	6.71	32.68	50	25.66	235.1	1.48	0.37	1476.
75	5.09	32.77	75	25.92	209.7	2.03	0.72	1470.
100	4.28	32.95	99	26.15	188.0	2.53	1.16	1467.
125	4.49	33.36	124	26.46	159.5	2.96	1.65	1469.
150	4.61	33.69	149	26.71	136.3	3.33	2.17	1470.
175	4.36	33.79	174	26.81	126.4	3.65	2.70	1470.
200	4.23	33.82	199	26.85	123.0	3.96	3.30	1469.
225	4.13	33.85	223	26.88	119.9	4.26	3.95	1470.
250	4.07	33.87	248	26.91	117.7	4.56	4.67	1470.
300	3.99	33.94	298	26.97	112.4	5.14	6.28	1470.
400	3.85	34.04	397	27.07	103.9	6.21	10.11	1471.
500	3.70	34.14	496	27.15	96.3	7.21	14.68	1473.
600	3.59	34.20	595	27.22	90.9	8.15	19.94	1474.
800	3.26	34.31	792	27.34	80.6	9.86	32.14	1476.
1000	2.95	34.39	990	27.43	72.9	11.39	46.14	1478.
1200	2.66	34.44	1187	27.49	67.2	12.79	61.74	1480.


TEMPERATURE, C
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12
16
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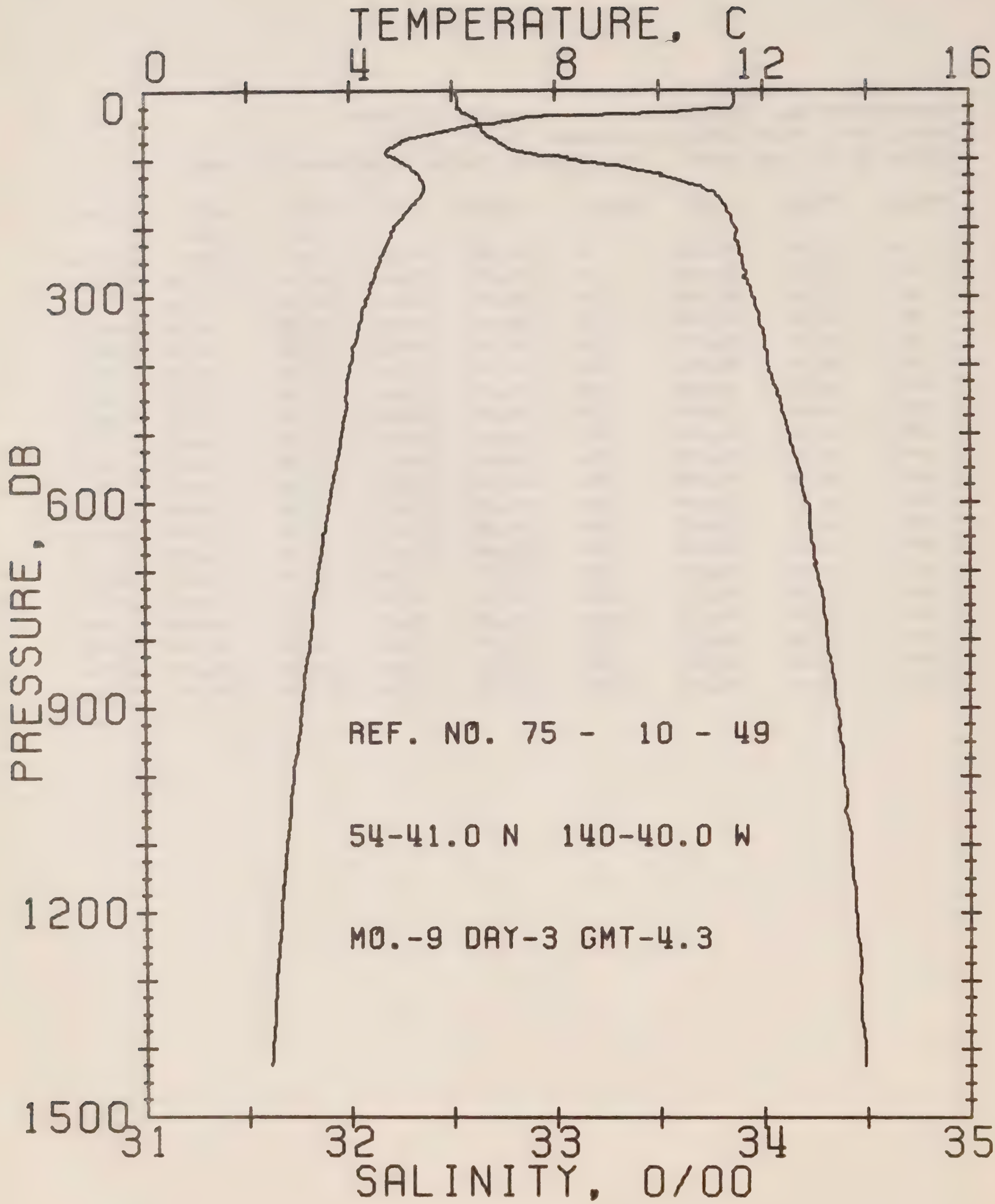
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 48
53-41.0 N 140-40.0 W
MO.-9 DAY-2 GMT-22.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 48 DATE 2/ 9/75
POSITION 53-41.0N, 140-40.0W GMT 22.5
RESULTS OF STP CAST 359 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.39	32.58	0	24.85	311.2	0.0	0.0	1492.
10	11.39	32.59	10	24.86	310.9	0.31	0.02	1492.
20	11.34	32.59	20	24.86	310.3	0.62	0.06	1492.
30	10.60	32.65	30	25.04	293.6	0.92	0.14	1490.
50	5.71	32.75	50	25.83	218.2	1.41	0.34	1472.
75	4.69	32.81	75	26.00	202.4	1.93	0.67	1468.
100	4.11	32.89	99	26.13	190.5	2.42	1.10	1466.
125	4.45	33.37	124	26.47	158.3	2.87	1.61	1469.
150	4.78	33.68	149	26.68	138.8	3.23	2.12	1471.
175	4.69	33.79	174	26.78	129.9	3.57	2.68	1471.
200	4.50	33.82	199	26.82	125.6	3.89	3.29	1471.
225	4.33	33.84	223	26.85	122.7	4.20	3.96	1470.
250	4.24	33.87	248	26.89	119.7	4.50	4.70	1470.
300	4.05	33.93	298	26.96	113.7	5.09	6.33	1471.
400	3.85	34.02	397	27.05	105.5	6.18	10.23	1471.
500	3.65	34.12	496	27.15	96.9	7.19	14.85	1472.
600	3.67	34.23	595	27.24	89.3	8.13	20.09	1474.
800	3.30	34.33	792	27.35	79.8	9.81	32.04	1476.
1000	2.92	34.42	990	27.45	70.6	11.30	45.74	1478.
1200	2.60	34.45	1187	27.51	65.8	12.66	60.97	1480.


TEMPERATURE, C
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16
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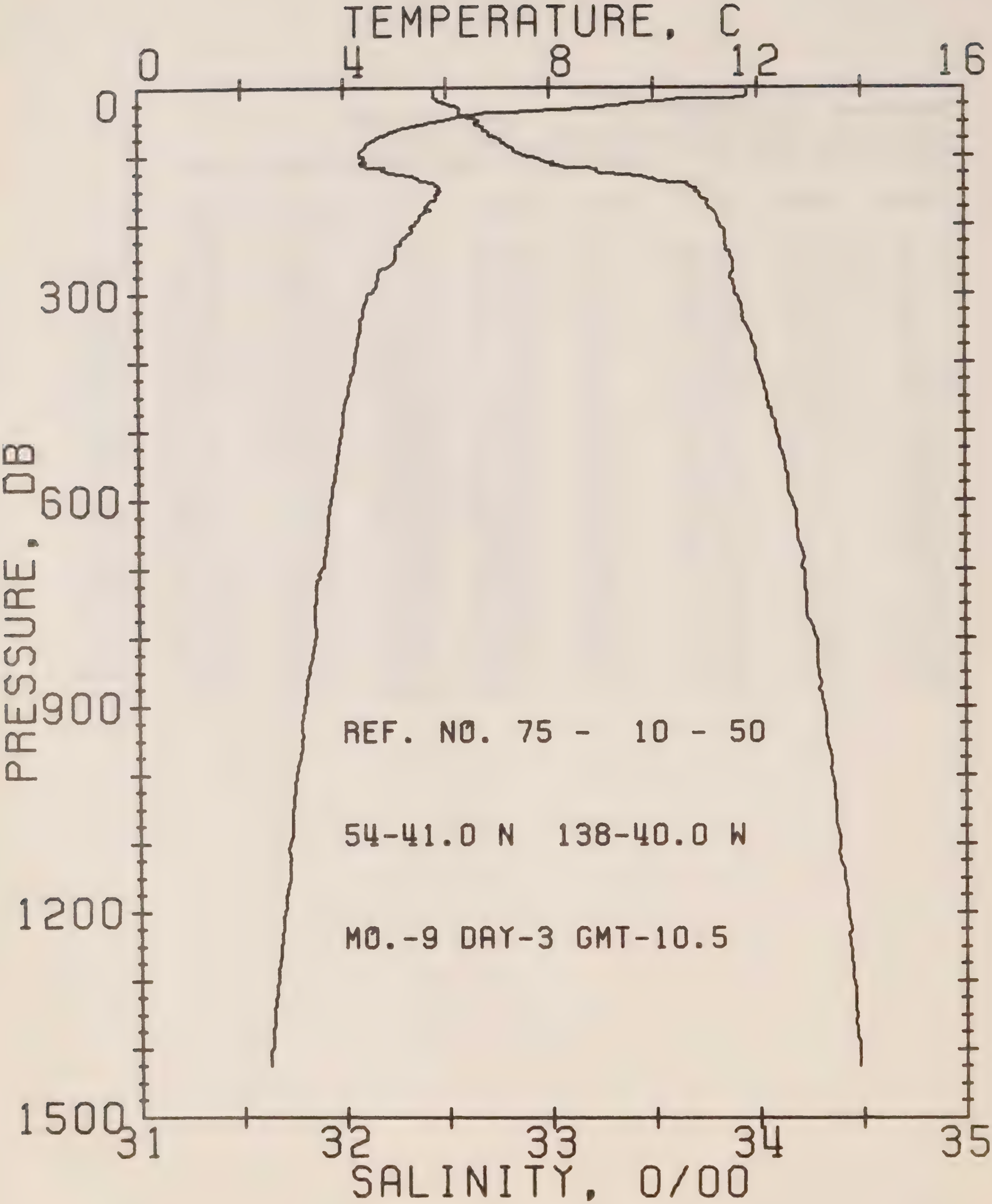
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 49
54-41.0 N 140-40.0 W
MO.-9 DAY-3 GMT-4.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 49 DATE 3/ 9/75
POSITION 54-41.0N, 140-40.0W GMT 4.3
RESULTS OF STP CAST 358 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.46	32.52	0	24.79	316.9	0.0	0.0	1492.
10	11.47	32.52	10	24.79	317.1	0.32	0.02	1493.
20	11.45	32.53	20	24.80	316.6	0.63	0.06	1493.
30	10.55	32.55	30	24.97	300.1	0.94	0.14	1490.
50	6.38	32.63	50	25.66	234.7	1.46	0.35	1474.
75	5.00	32.74	75	25.91	211.0	2.01	0.70	1469.
100	4.96	33.06	99	26.17	186.8	2.51	1.15	1470.
125	5.39	33.55	124	26.51	155.2	2.93	1.63	1473.
150	5.42	33.77	149	26.68	139.3	3.30	2.14	1474.
175	5.12	33.83	174	26.76	131.6	3.64	2.70	1473.
200	4.88	33.87	199	26.82	126.1	3.96	3.31	1472.
225	4.72	33.88	223	26.85	123.8	4.27	3.99	1472.
250	4.59	33.90	248	26.87	121.3	4.58	4.73	1472.
300	4.38	33.95	298	26.94	115.7	5.17	6.39	1472.
400	4.01	34.02	397	27.03	107.2	6.27	10.32	1472.
500	3.84	34.12	496	27.13	99.0	7.30	15.03	1473.
600	3.59	34.21	595	27.22	90.5	8.25	20.32	1474.
800	3.21	34.31	792	27.34	80.4	9.95	32.45	1476.
1000	2.88	34.39	990	27.43	72.4	11.47	46.37	1478.
1200	2.64	34.44	1187	27.50	66.6	12.86	61.89	1480.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12
16
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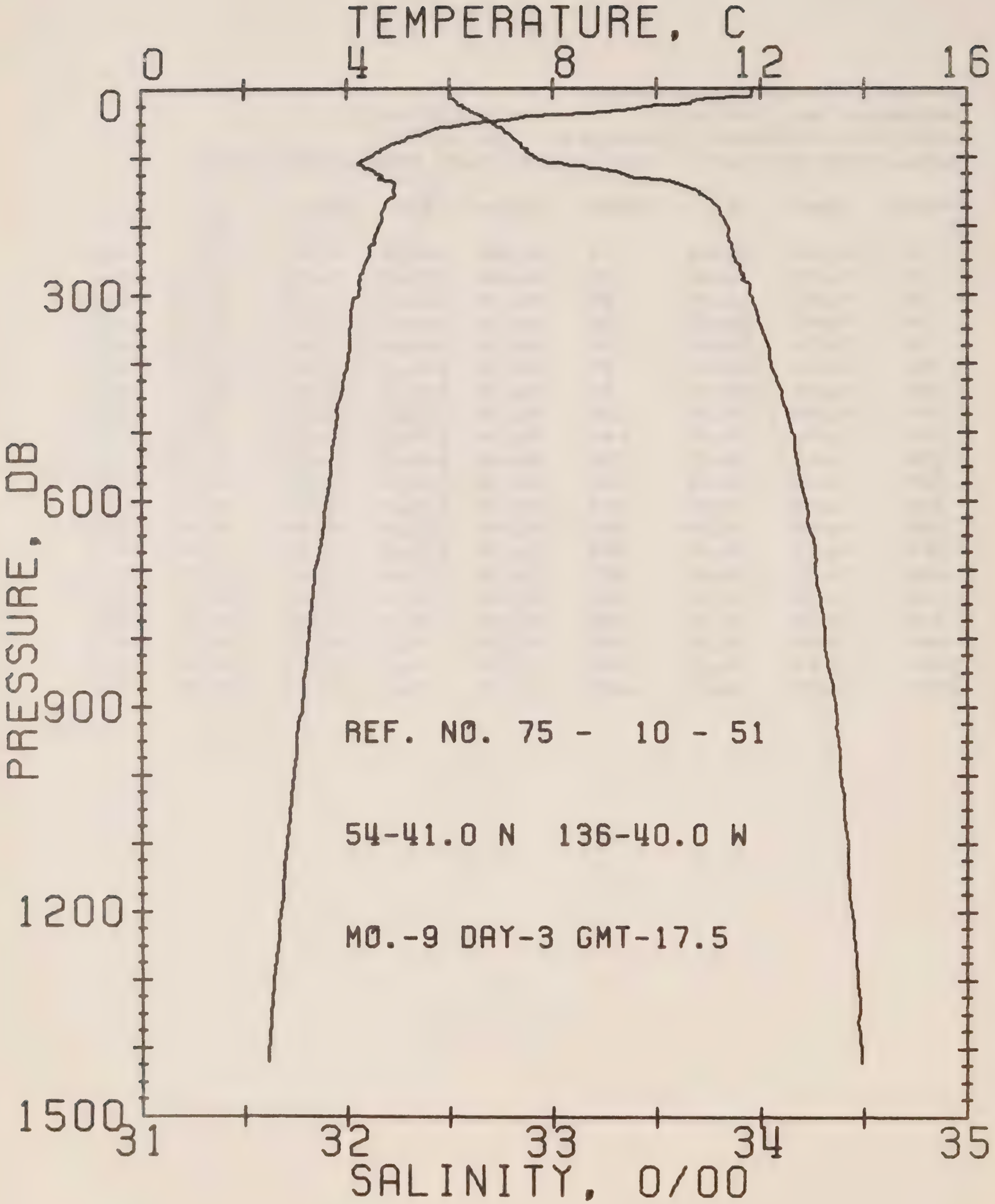
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 50
54-41.0 N 138-40.0 W
MO.-9 DAY-3 GMT-10.5
31
32
33
34
35
SALINITY, 0/00

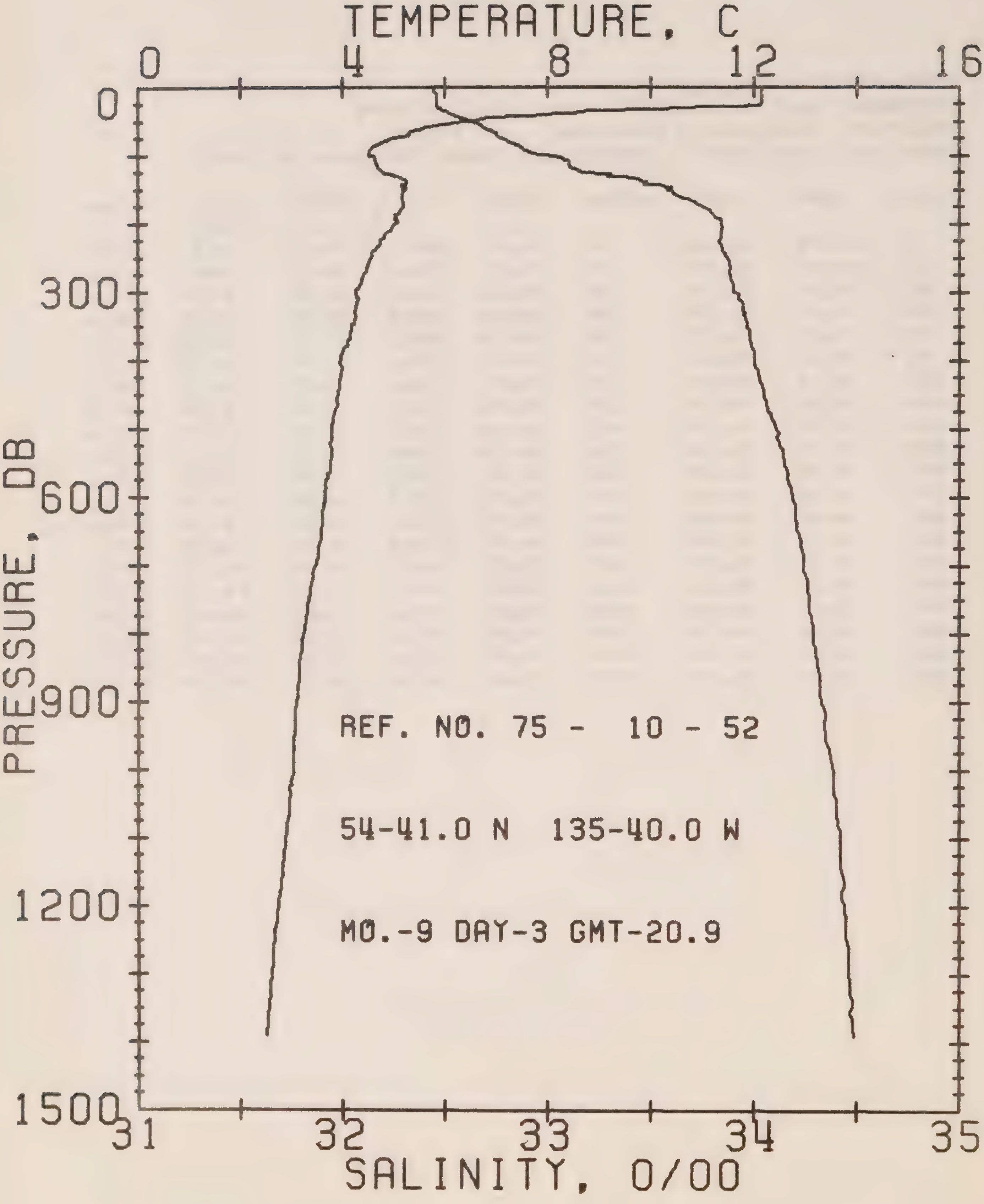
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 50 DATE 3/ 9/75
POSITION 54-41.0N, 138-40.0W GMT 10.5
RESULTS OF STP CAST 349 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.82	32.44	0	24.66	329.0	0.0	0.0	1494.
10	11.82	32.44	10	24.66	329.5	0.33	0.02	1494.
20	9.91	32.49	20	25.03	294.1	0.65	0.07	1487.
30	8.61	32.57	30	25.30	268.7	0.93	0.14	1483.
50	5.74	32.66	50	25.76	225.0	1.41	0.33	1472.
75	4.61	32.77	75	25.98	204.7	1.95	0.67	1468.
100	4.33	32.91	99	26.12	191.5	2.45	1.11	1467.
125	5.08	33.34	124	26.38	167.1	2.90	1.63	1471.
150	5.89	33.70	149	26.56	150.1	3.29	2.18	1475.
175	5.60	33.77	174	26.66	141.7	3.65	2.78	1475.
200	5.35	33.82	199	26.72	135.3	4.00	3.44	1474.
225	5.12	33.84	223	26.77	131.4	4.33	4.16	1474.
250	4.99	33.88	248	26.81	127.4	4.65	4.94	1474.
300	4.48	33.89	298	26.88	121.3	5.28	6.68	1472.
400	4.20	33.99	397	26.99	111.4	6.43	10.79	1473.
500	3.95	34.09	496	27.09	102.4	7.50	15.67	1474.
600	3.73	34.16	595	27.17	95.7	8.49	21.22	1474.
800	3.42	34.28	792	27.29	84.9	10.29	34.07	1477.
1000	3.03	34.35	990	27.39	76.7	11.91	48.90	1478.
1200	2.79	34.43	1187	27.47	69.3	13.38	65.31	1481.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 51
54-41.0 N 136-40.0 W
MO.-9 DAY-3 GMT-17.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 51 DATE 3/ 9/75
POSITION 54-41.0N, 136-40.0W GMT 17.5
RESULTS OF STP CAST 225 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.79	32.50	0	24.71	324.1	0.0	0.0	1494.
10	11.83	32.51	10	24.71	324.7	0.32	0.02	1494.
20	10.67	32.54	20	24.94	302.7	0.64	0.06	1490.
30	9.45	32.59	30	25.19	279.6	0.93	0.14	1486.
50	6.41	32.71	50	25.72	228.9	1.43	0.34	1475.
75	5.12	32.83	75	25.97	205.6	1.97	0.68	1470.
100	4.43	32.91	99	26.11	192.2	2.47	1.13	1468.
125	4.69	33.36	124	26.44	161.7	2.91	1.63	1470.
150	4.93	33.70	149	26.68	139.0	3.28	2.14	1471.
175	4.72	33.80	174	26.78	129.4	3.61	2.70	1471.
200	4.64	33.84	199	26.82	125.7	3.93	3.31	1471.
225	4.54	33.86	223	26.85	123.7	4.24	3.98	1471.
250	4.40	33.88	248	26.88	120.5	4.55	4.72	1471.
300	4.23	33.95	298	26.95	114.2	5.13	6.35	1471.
400	4.01	34.05	397	27.05	105.3	6.22	10.23	1472.
500	3.76	34.15	496	27.16	95.7	7.22	14.81	1473.
600	3.60	34.21	595	27.23	90.2	8.15	20.03	1474.
800	3.24	34.31	792	27.34	80.6	9.85	32.12	1476.
1000	2.94	34.38	990	27.42	73.2	11.38	46.13	1478.
1200	2.70	34.44	1187	27.49	67.6	12.79	61.98	1480.


TEMPERATURE, C
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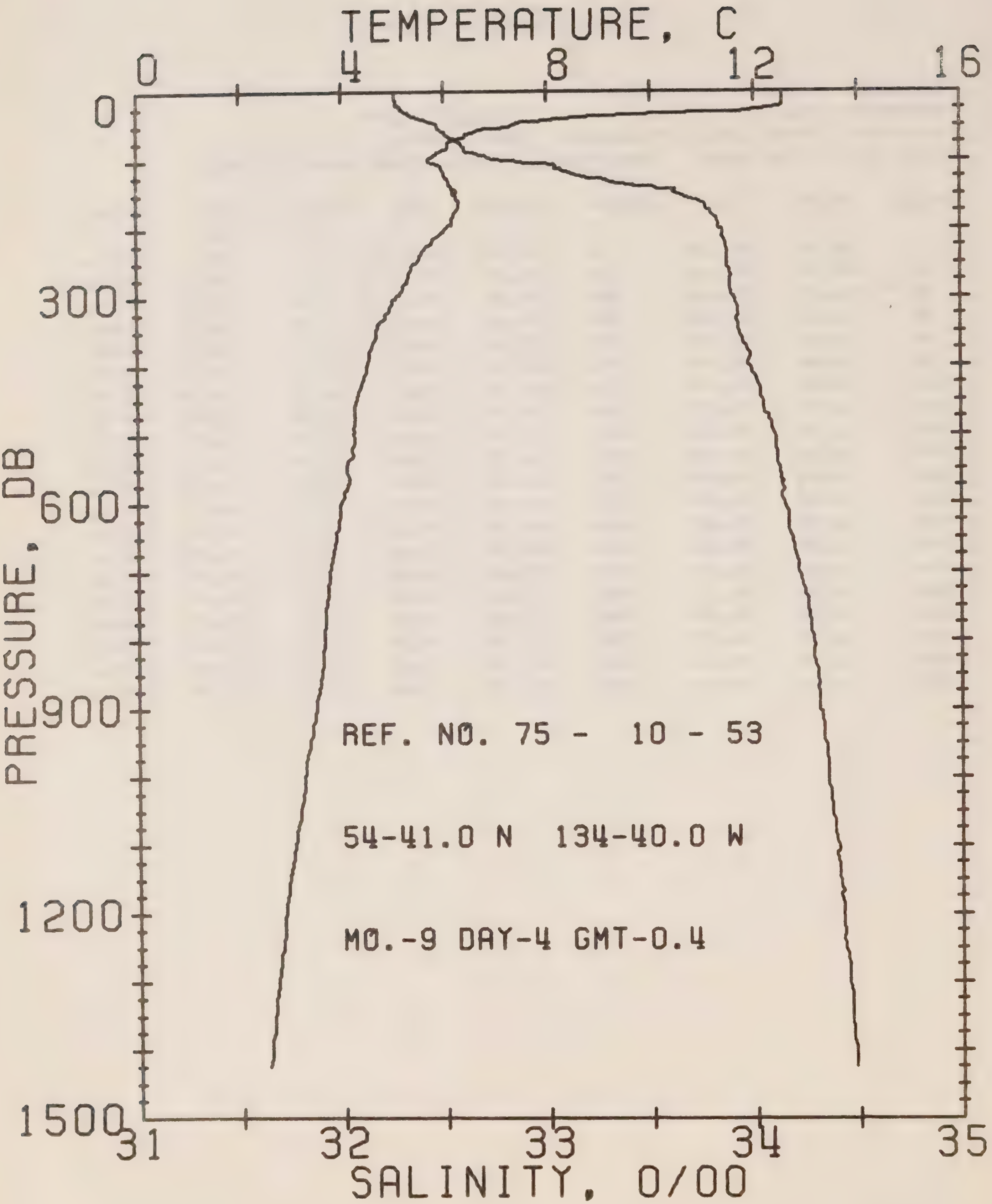
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 52
54-41.0 N 135-40.0 W
MO.-9 DAY-3 GMT-20.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 52 DATE 3/ 9/75
POSITION 54-41.0N, 135-40.0W GMT 20.9
RESULTS OF STP CAST 357 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.15	32.45	0	24.61	334.2	0.0	0.0	1495.
10	12.15	32.46	10	24.61	333.8	0.33	0.02	1495.
20	12.15	32.46	20	24.61	334.1	0.67	0.07	1495.
30	10.42	32.48	30	24.94	303.2	1.00	0.15	1489.
50	6.37	32.65	50	25.68	233.2	1.52	0.36	1474.
75	4.96	32.79	75	25.96	206.5	2.06	0.71	1469.
100	4.57	33.04	99	26.20	184.2	2.55	1.14	1468.
125	4.83	33.27	124	26.35	169.9	3.00	1.66	1470.
150	5.21	33.60	149	26.57	149.6	3.40	2.21	1472.
175	5.18	33.77	174	26.70	136.8	3.76	2.81	1473.
200	5.03	33.84	199	26.78	130.1	4.09	3.44	1473.
225	4.75	33.84	223	26.81	127.3	4.41	4.14	1472.
250	4.56	33.87	248	26.85	123.2	4.73	4.90	1472.
300	4.28	33.91	298	26.92	117.2	5.33	6.58	1471.
400	3.96	34.00	397	27.02	108.4	6.46	10.59	1472.
500	3.79	34.11	496	27.12	99.3	7.50	15.37	1473.
600	3.66	34.19	595	27.20	92.6	8.46	20.75	1474.
800	3.23	34.29	792	27.32	82.0	10.20	33.15	1476.
1000	3.03	34.39	990	27.42	74.1	11.77	47.45	1478.
1200	2.74	34.44	1187	27.49	68.0	13.19	63.34	1480.


TEMPERATURE, C
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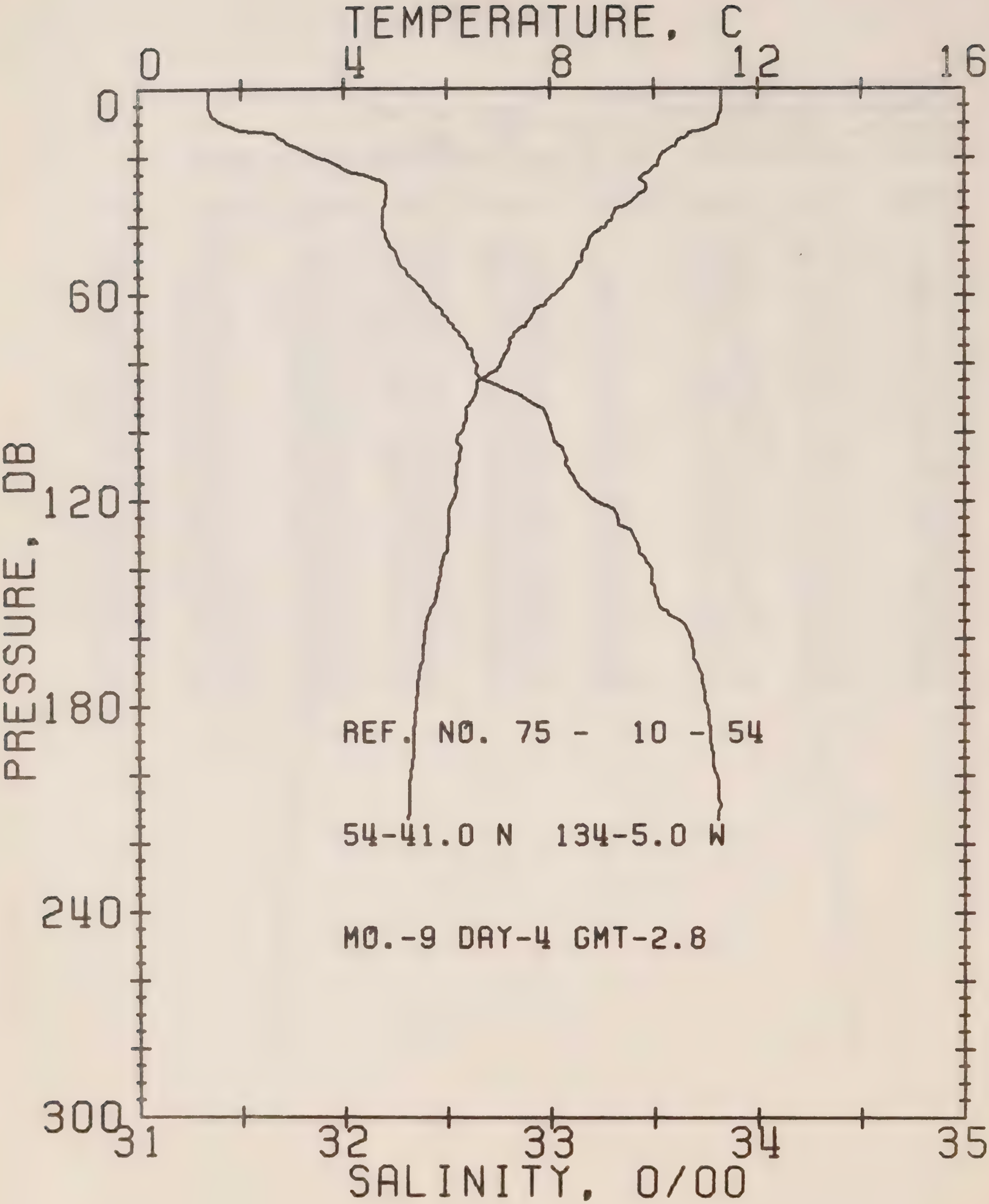
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 53
54-41.0 N 134-40.0 W
MO.-9 DAY-4 GMT-0.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 53 DATE 4/ 9/75
POSITION 54-41.0N, 134-40.0W GMT 0.4
RESULTS OF STP CAST 378 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.57	32.26	0	24.38	355.7	0.0	0.0	1496.
10	12.57	32.26	10	24.38	356.2	0.36	0.02	1496.
20	12.52	32.28	20	24.41	354.0	0.71	0.07	1496.
30	10.74	32.33	30	24.77	319.6	1.06	0.16	1490.
50	7.32	32.47	50	25.41	258.7	1.62	0.39	1478.
75	6.09	32.59	75	25.66	234.5	2.23	0.77	1473.
100	5.71	32.82	99	25.89	213.2	2.80	1.28	1473.
125	6.05	33.20	124	26.15	189.1	3.29	1.85	1475.
150	6.19	33.64	149	26.48	158.3	3.72	2.45	1476.
175	6.23	33.79	174	26.59	148.0	4.10	3.08	1477.
200	6.02	33.84	199	26.66	141.9	4.46	3.77	1477.
225	5.67	33.86	223	26.72	136.5	4.81	4.52	1476.
250	5.42	33.87	248	26.76	133.1	5.15	5.33	1475.
300	5.06	33.90	298	26.82	127.1	5.80	7.16	1475.
400	4.49	33.97	397	26.94	116.1	7.01	11.46	1474.
500	4.23	34.10	496	27.07	105.0	8.10	16.48	1475.
600	3.96	34.14	595	27.13	99.6	9.13	22.21	1475.
800	3.63	34.28	792	27.28	87.1	10.98	35.40	1477.
1000	3.23	34.35	990	27.37	78.9	12.65	50.61	1479.
1200	2.85	34.42	1187	27.46	70.7	14.14	67.28	1481.


TEMPERATURE, C
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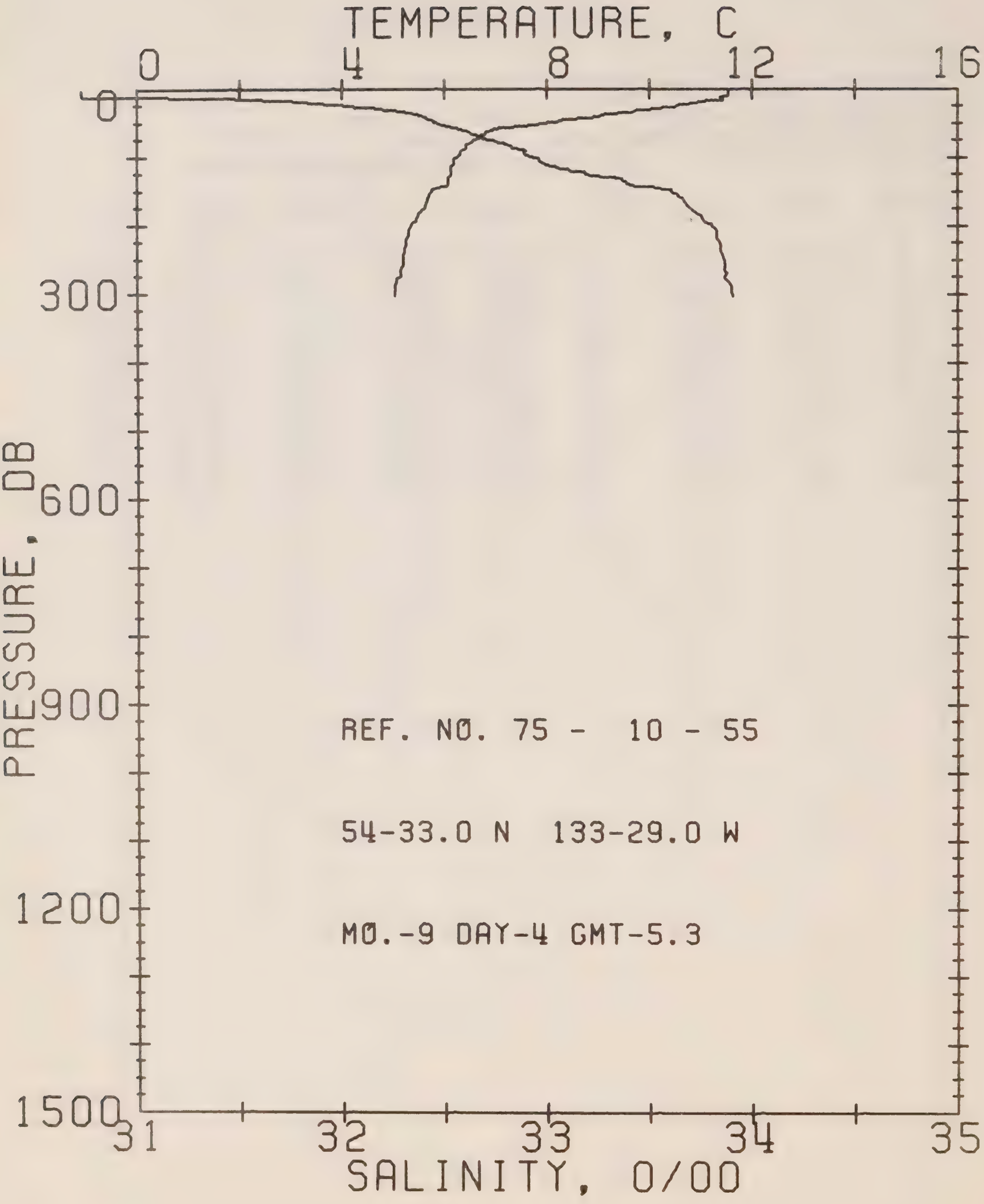
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 75 - 10 - 54
54-41.0 N 134-5.0 W
MO.-9 DAY-4 GMT-2.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 54 DATE 4/ 9/75
POSITION 54-41.0N, 134- 5.0W GMT 2.8
RESULTS OF STP CAST 147 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.30	31.34	0	23.90	401.3	0.0	0.0	1490.
10	11.23	31.41	10	23.97	395.3	0.40	0.02	1490.
20	10.10	31.88	20	24.53	342.3	0.77	0.08	1487.
30	9.81	32.21	30	24.83	313.5	1.09	0.16	1487.
50	8.61	32.26	50	25.06	292.1	1.69	0.40	1483.
75	7.21	32.60	75	25.53	247.9	2.37	0.83	1478.
100	6.26	33.00	99	25.97	206.4	2.93	1.33	1475.
125	6.02	33.32	124	26.25	179.5	3.42	1.89	1475.
150	5.73	33.51	149	26.43	162.3	3.84	2.48	1474.
175	5.41	33.74	174	26.65	142.0	4.21	3.09	1474.
200	5.27	33.80	199	26.72	135.9	4.56	3.76	1474.


TEMPERATURE, C
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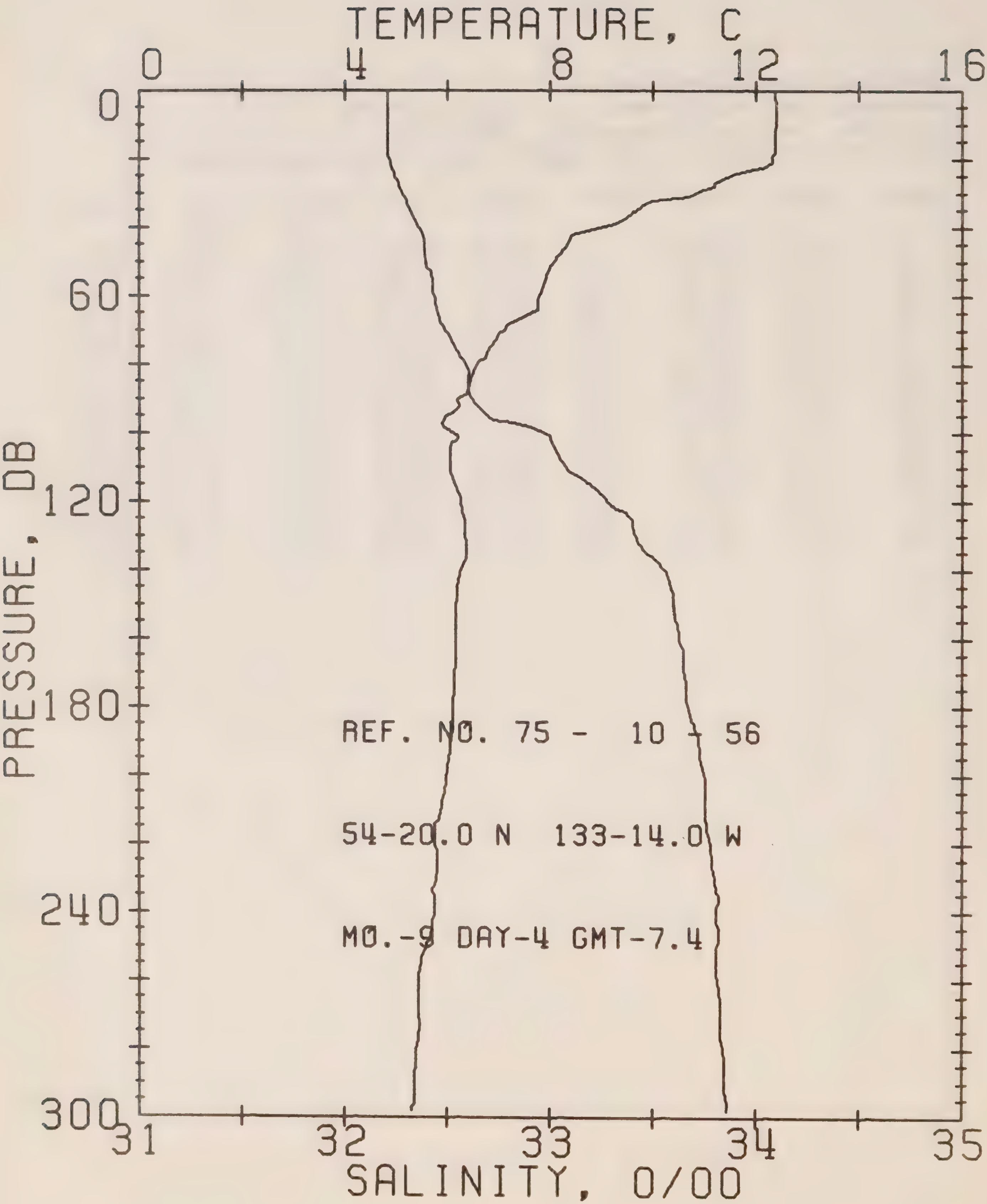
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 55
54-33.0 N 133-29.0 W
MO.-9 DAY-4 GMT-5.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 55 DATE 4/ 9/75
POSITION 54-33.0N, 133-29.0W GMT 5.3
RESULTS OF STP CAST 159 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.55	30.73	0	23.39	450.6	0.0	0.0	1491.
10	11.45	31.09	10	23.68	422.7	0.45	0.02	1491.
20	10.81	31.89	20	24.42	353.0	0.84	0.08	1490.
30	9.77	32.26	30	24.88	309.2	1.17	0.17	1487.
50	7.96	32.47	50	25.32	267.3	1.74	0.40	1480.
75	6.55	32.75	75	25.73	228.2	2.35	0.78	1476.
100	6.23	32.95	99	25.93	209.6	2.89	1.27	1475.
125	6.13	33.20	124	26.14	189.6	3.39	1.84	1475.
150	5.75	33.61	149	26.51	155.1	3.82	2.44	1475.
175	5.58	33.71	174	26.61	146.0	4.20	3.06	1475.
200	5.35	33.81	199	26.72	136.1	4.55	3.74	1474.
225	5.25	33.84	223	26.75	132.7	4.89	4.46	1474.
250	5.20	33.87	248	26.78	130.8	5.22	5.26	1474.
300	5.03	33.90	298	26.83	126.3	5.86	7.06	1475.


TEMPERATURE, C
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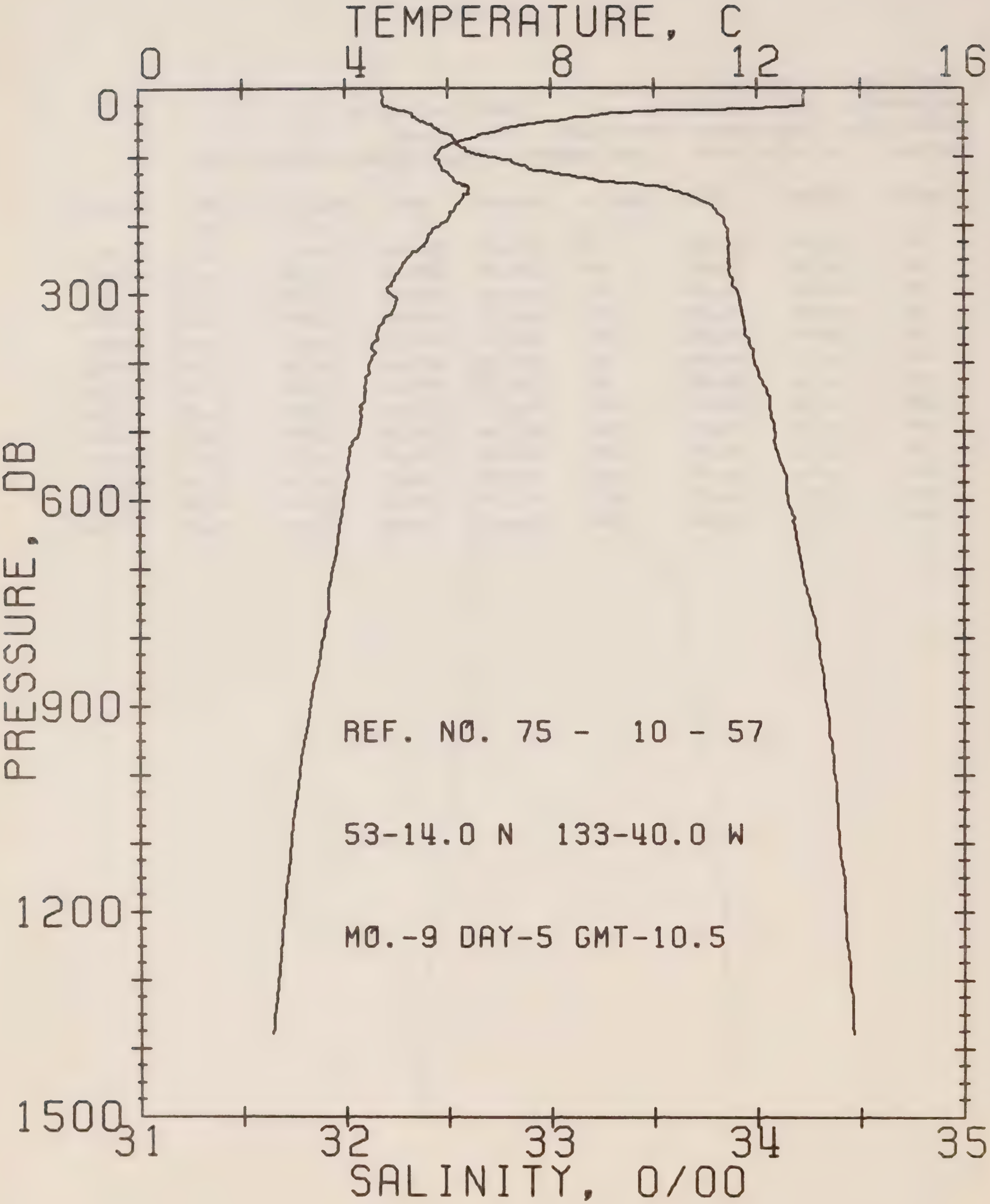
12
16
PRESSURE, DB
0
60
120
180
240
300
31
32
33
34
35
SALINITY, 0/00
REF. NO. 75 - 10 - 56
54-20.0 N 133-14.0 W
MO.-9 DAY-4 GMT-7.4

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 56 DATE 4/ 9/75
POSITION 54-20.0N, 133-14.0W GMT 7.4
RESULTS OF STP CAST 152 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.38	32.21	0	24.38	356.0	0.0	0.0	1495.
10	12.39	32.21	10	24.38	356.6	0.36	0.02	1495.
20	12.32	32.21	20	24.39	355.2	0.71	0.07	1495.
30	10.84	32.28	30	24.71	325.0	1.05	0.16	1490.
50	8.07	32.40	50	25.25	273.7	1.64	0.40	1481.
75	6.83	32.54	75	25.53	247.4	2.30	0.81	1476.
100	6.14	32.98	99	25.97	206.3	2.88	1.33	1475.
125	6.34	33.40	124	26.27	177.7	3.36	1.88	1476.
150	6.17	33.59	149	26.44	161.6	3.78	2.47	1476.
175	6.12	33.66	174	26.50	156.3	4.18	3.13	1477.
200	5.98	33.75	199	26.59	148.3	4.56	3.86	1477.
225	5.81	33.79	223	26.65	143.3	4.93	4.65	1476.
250	5.60	33.82	248	26.69	138.8	5.28	5.50	1476.


TEMPERATURE, C
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12
16
PRESSURE, DB
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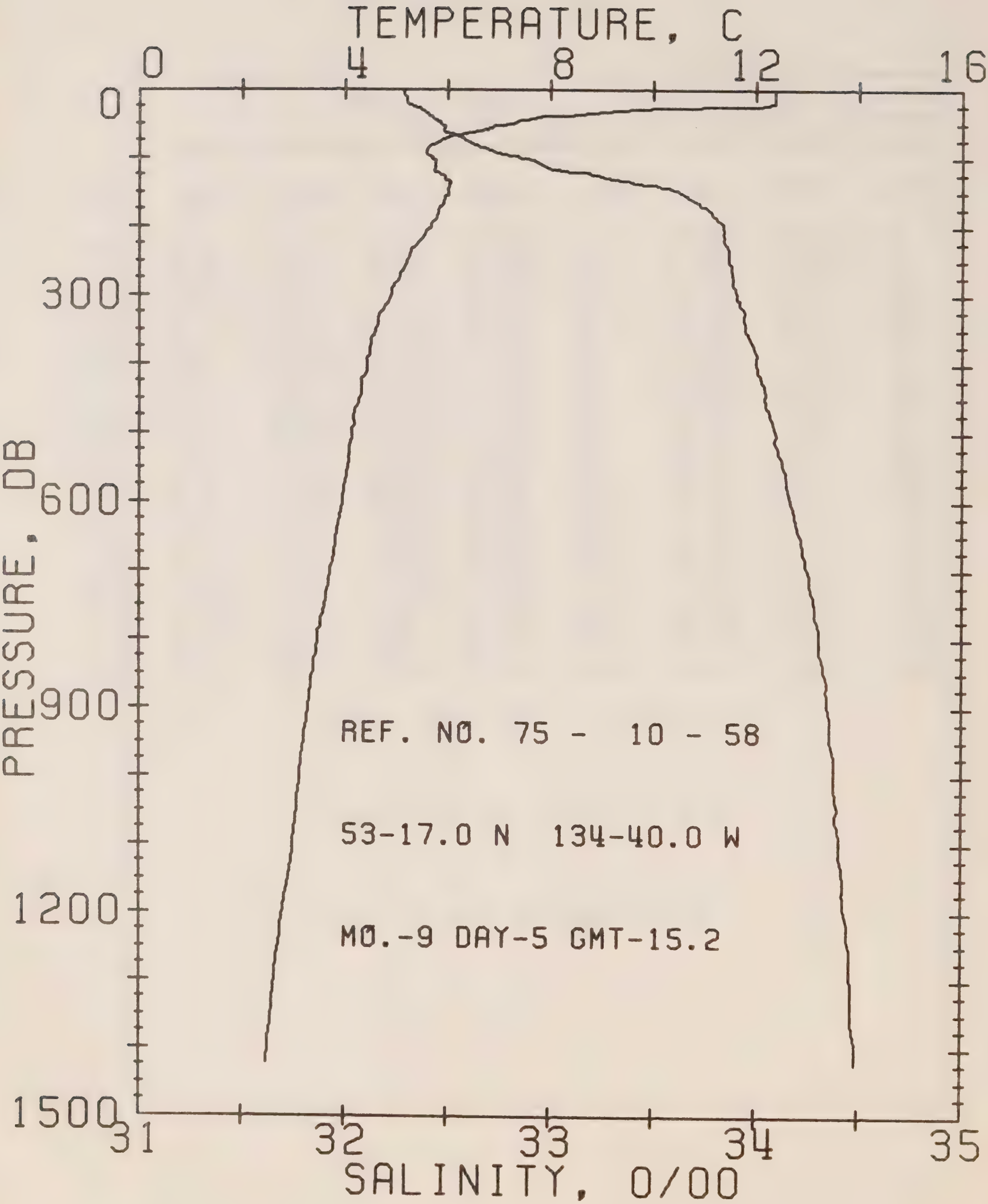
300
600
900
1200
1500
REF. NO. 75 - 10 - 57
53-14.0 N 133-40.0 W
MO.-9 DAY-5 GMT-10.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 57 DATE 5/ 9/75
POSITION 53-14.0N. 133-40.0W GMT 10.5
RESULTS OF STP CAST 302 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.91	32.18	0	24.25	367.9	0.0	0.0	1497.
10	12.91	32.18	10	24.25	368.2	0.37	0.02	1497.
20	12.91	32.18	20	24.25	368.6	0.74	0.08	1497.
30	11.42	32.25	30	24.59	336.7	1.10	0.17	1492.
50	7.83	32.39	50	25.28	271.4	1.68	0.40	1480.
75	6.31	32.53	75	25.59	241.5	2.32	0.81	1474.
100	5.77	32.73	99	25.81	220.6	2.90	1.32	1473.
125	6.04	33.06	124	26.04	199.5	3.43	1.93	1475.
150	6.37	33.61	149	26.43	162.8	3.88	2.56	1477.
175	6.12	33.80	174	26.61	145.7	4.26	3.19	1477.
200	5.83	33.85	199	26.69	138.8	4.62	3.87	1476.
225	5.55	33.86	223	26.73	134.9	4.96	4.61	1475.
250	5.18	33.86	248	26.78	130.9	5.29	5.42	1474.
300	4.91	33.92	298	26.85	123.9	5.93	7.20	1474.
400	4.46	33.99	397	26.96	114.6	7.12	11.44	1474.
500	4.26	34.08	496	27.06	106.2	8.22	16.46	1475.
600	3.94	34.15	595	27.14	98.7	9.24	22.17	1475.
800	3.55	34.29	793	27.29	85.5	11.08	35.26	1477.
1000	3.08	34.37	990	27.40	75.5	12.68	49.91	1478.
1200	2.79	34.42	1188	27.47	69.8	14.13	66.14	1481.



TEMPERATURE, C
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16
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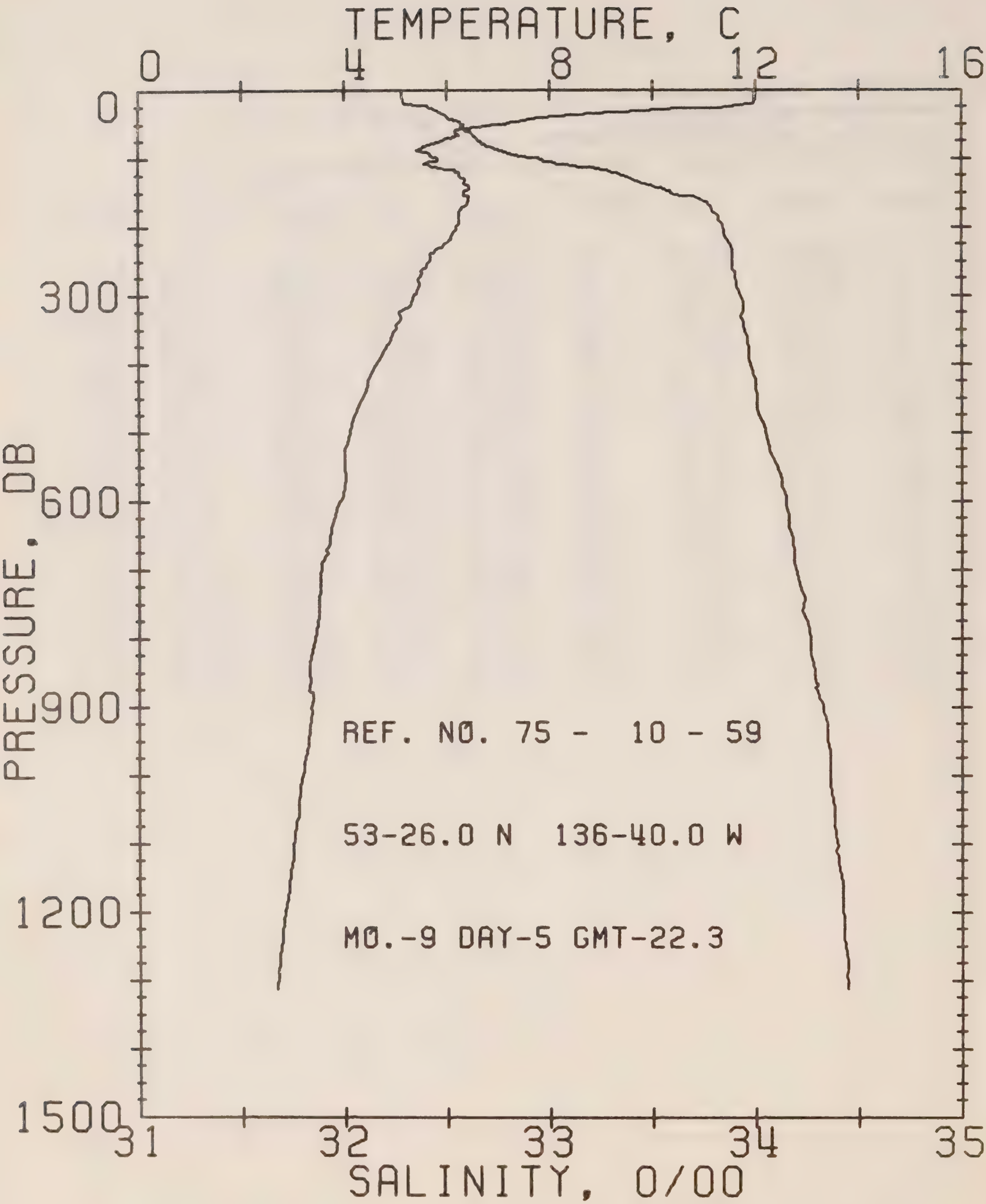
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 58
53-17.0 N 134-40.0 W
MO.-9 DAY-5 GMT-15.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 58 DATE 5/ 9/75
POSITION 53-17.0N, 134-40.0W GMT 15.2
RESULTS OF STP CAST 315 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.37	32.29	0	24.44	349.9	0.0	0.0	
10	12.37	32.30	10	24.45	349.6	0.35	0.02	1495.
20	12.34	32.31	20	24.46	348.6	0.70	0.07	1496.
30	9.27	32.38	30	25.05	292.3	1.02	0.15	1496.
50	7.14	32.47	50	25.44	255.9	1.56	0.37	1485.
75	5.84	32.60	75	25.70	230.7	2.17	0.76	1477.
100	5.69	32.88	99	25.94	208.5	2.72	1.25	1472.
125	5.91	33.23	124	26.19	184.9	3.22	1.82	1473.
150	6.00	33.63	149	26.50	156.4	3.64	2.41	1474.
175	5.81	33.78	174	26.63	143.7	4.02	3.03	1476.
200	5.66	33.84	199	26.70	137.5	4.37	3.70	1476.
225	5.38	33.86	223	26.75	132.9	4.71	4.43	1475.
250	5.20	33.87	248	26.78	130.4	5.03	5.23	1475.
300	4.88	33.91	298	26.85	124.2	5.67	7.01	1474.
400	4.43	34.00	397	26.97	113.4	6.85	11.21	1474.
500	4.13	34.10	496	27.08	103.8	7.94	16.17	1474.
600	3.94	34.17	595	27.16	97.1	8.94	21.80	1474.
800	3.48	34.31	793	27.31	83.2	10.73	34.54	1475.
1000	3.13	34.38	990	27.40	75.6	12.31	48.96	1477.
1200	2.78	34.44	1187	27.48	68.9	13.76	65.18	1479.
								1481.


TEMPERATURE, C
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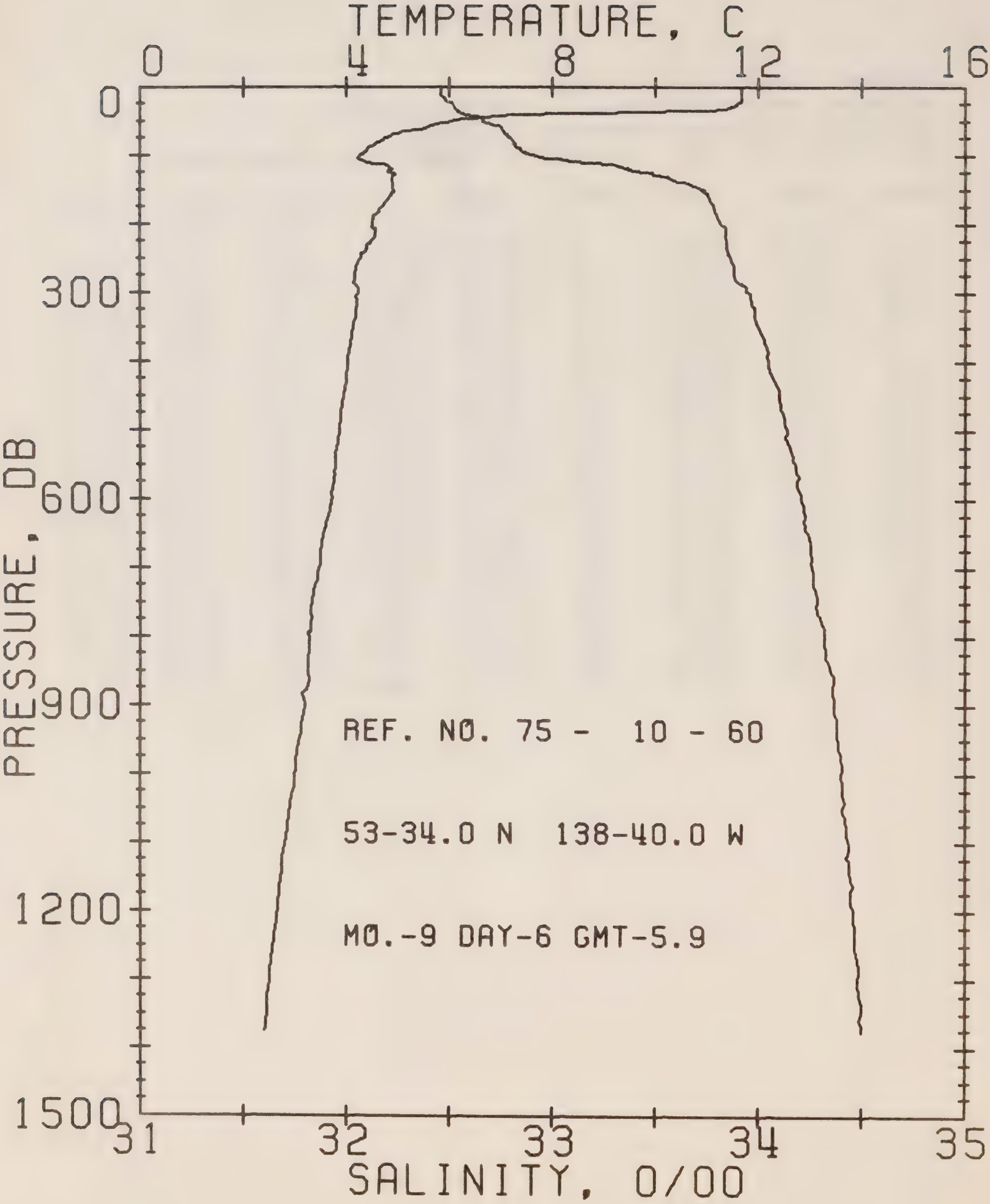
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 59
53-26.0 N 136-40.0 W
MO.-9 DAY-5 GMT-22.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 59 DATE 5/ 9/75
POSITION 53-26.0N, 136-40.0W GMT 22.3
RESULTS OF STP CAST 264 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.98	32.28	0	24.51	343.7	0.0	0.0	1494.
10	11.98	32.28	10	24.51	344.1	0.34	0.02	1494.
20	11.79	32.33	20	24.58	337.3	0.69	0.07	1494.
30	9.62	32.45	30	25.05	292.5	1.00	0.15	1486.
50	7.07	32.58	50	25.53	247.1	1.53	0.36	1477.
75	5.85	32.67	75	25.76	225.8	2.12	0.74	1473.
100	5.83	32.95	99	25.98	204.5	2.66	1.21	1473.
125	6.25	33.36	124	26.25	179.3	3.13	1.76	1476.
150	6.34	33.59	149	26.42	163.8	3.56	2.36	1477.
175	6.24	33.79	174	26.59	148.0	3.94	2.99	1477.
200	6.18	33.84	199	26.64	143.9	4.31	3.69	1478.
225	5.96	33.88	223	26.70	138.6	4.66	4.45	1477.
250	5.65	33.89	248	26.74	134.3	5.00	5.28	1476.
300	5.36	33.92	298	26.80	129.0	5.66	7.12	1476.
400	4.61	33.98	397	26.93	117.4	6.89	11.49	1475.
500	4.11	34.05	496	27.05	107.0	8.01	16.62	1474.
600	3.89	34.15	595	27.15	98.1	9.03	22.36	1475.
800	3.42	34.27	793	27.29	85.7	10.87	35.40	1477.
1000	3.16	34.36	990	27.38	77.4	12.49	50.28	1479.
1200	2.83	34.42	1187	27.46	70.3	13.97	66.79	1481.


TEMPERATURE, C
0
4
8
12
16
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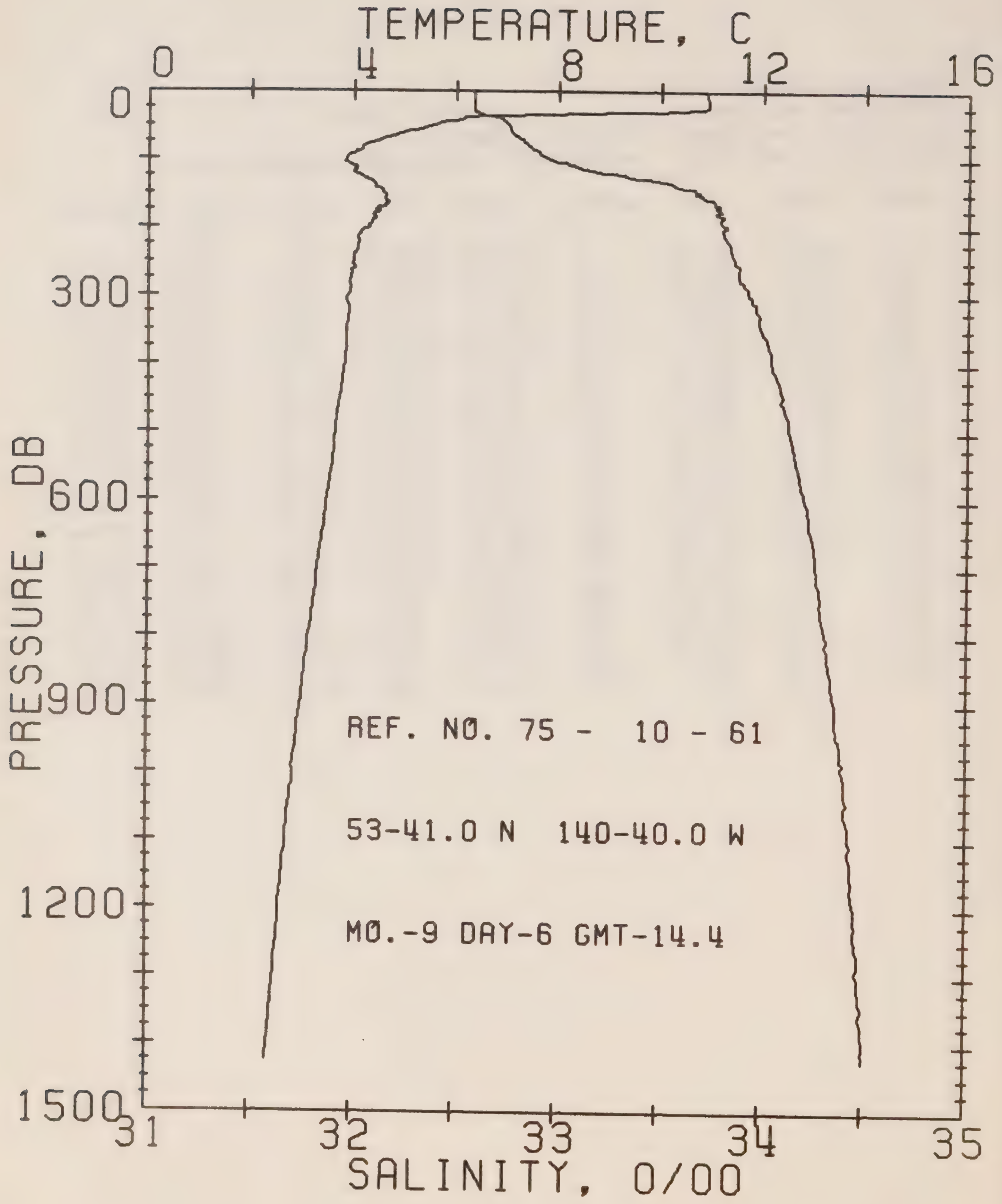
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 60
53-34.0 N 138-40.0 W
MO.-9 DAY-6 GMT-5.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 60 DATE 6/ 9/75
POSITION 53-34.0N, 138-40.0W GMT 5.9
RESULTS OF STP CAST 376 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.69	32.46	0	24.70	325.3	0.0	0.0	1493.
10	11.69	32.46	10	24.70	325.7	0.33	0.02	1493.
20	11.68	32.49	20	24.73	323.5	0.65	0.07	1494.
30	11.29	32.54	30	24.83	313.4	0.97	0.15	1492.
50	5.98	32.67	50	25.74	227.1	1.49	0.36	1473.
75	4.73	32.81	75	26.00	202.5	2.02	0.69	1468.
100	4.26	32.93	99	26.14	189.2	2.52	1.13	1467.
125	4.89	33.49	124	26.52	154.0	2.95	1.62	1471.
150	4.93	33.73	149	26.71	136.3	3.31	2.13	1471.
175	4.68	33.78	174	26.77	130.4	3.64	2.68	1471.
200	4.50	33.82	199	26.82	125.8	3.96	3.29	1471.
225	4.48	33.85	223	26.85	123.6	4.27	3.97	1471.
250	4.26	33.87	248	26.88	120.2	4.58	4.71	1470.
300	4.23	33.96	298	26.96	113.3	5.17	6.35	1471.
400	4.03	34.05	397	27.05	105.4	6.26	10.24	1472.
500	3.87	34.14	496	27.14	97.7	7.27	14.89	1473.
600	3.72	34.21	595	27.21	91.8	8.22	20.19	1474.
800	3.28	34.32	792	27.34	80.3	9.94	32.38	1476.
1000	2.99	34.40	990	27.43	72.4	11.46	46.31	1478.
1200	2.66	34.46	1187	27.51	65.7	12.83	61.73	1480.


TEMPERATURE, C
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4
8
12
16
PRESSURE, DB
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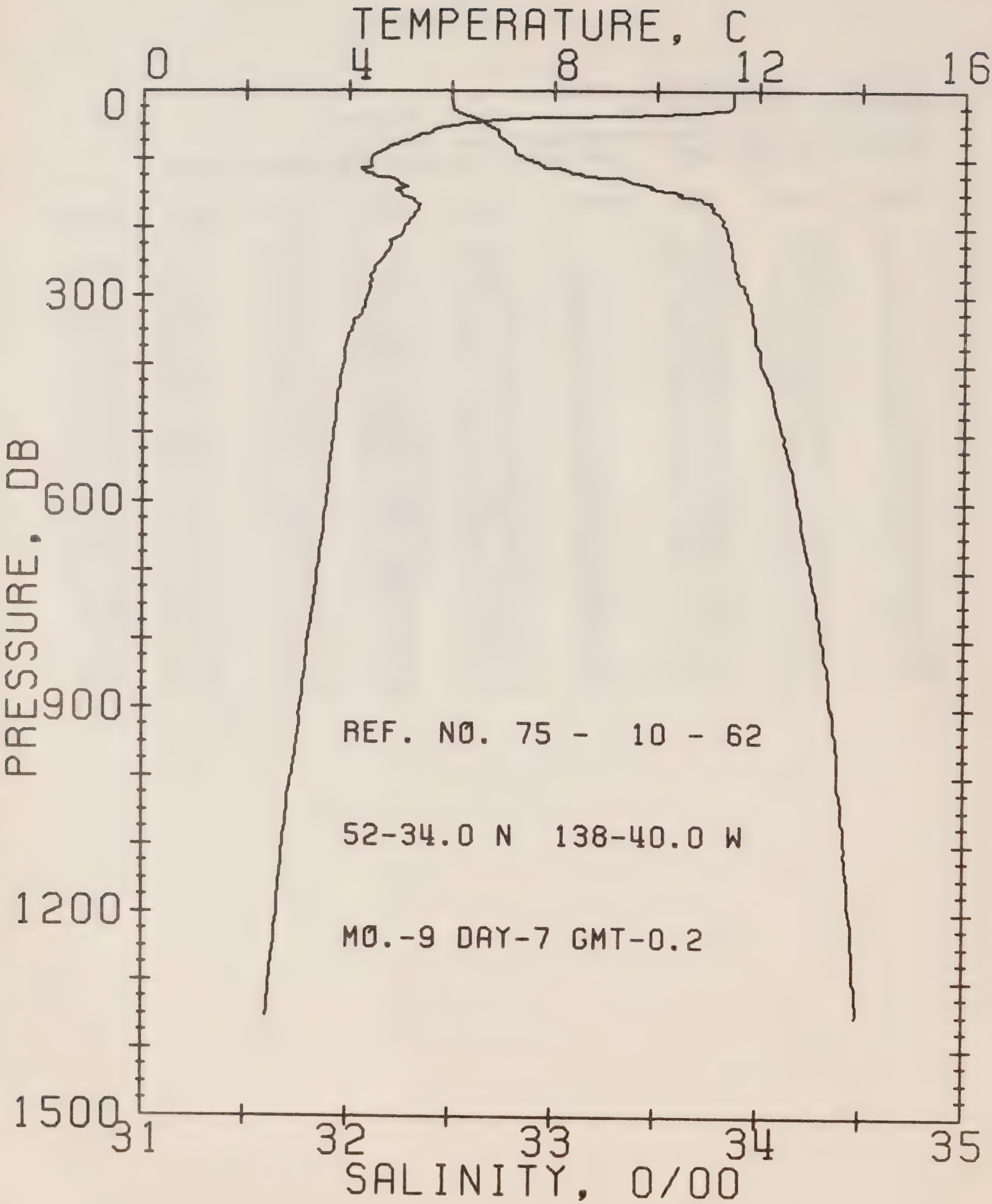
300
600
900
1200
1500
REF. NO. 75 - 10 - 61
53-41.0 N 140-40.0 W
MO.-9 DAY-6 GMT-14.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 61 DATE 6/ 9/75
POSITION 53-41.0N, 140-40.0W GMT 14.4
RESULTS OF STP CAST 350 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.91	32.59	0	24.94	302.3	0.0	0.0	1491.
10	10.92	32.59	10	24.94	302.9	0.30	0.02	1491.
20	10.92	32.59	20	24.94	303.1	0.61	0.06	1491.
30	9.47	32.60	30	25.19	279.3	0.90	0.14	1486.
50	5.60	32.75	50	25.85	216.6	1.37	0.33	1471.
75	4.40	32.83	75	26.05	197.7	1.89	0.65	1467.
100	3.85	32.96	99	26.21	183.0	2.36	1.08	1465.
125	4.18	33.35	124	26.48	157.1	2.79	1.57	1467.
150	4.61	33.69	149	26.71	136.0	3.15	2.07	1470.
175	4.52	33.80	174	26.80	127.3	3.48	2.61	1470.
200	4.31	33.82	199	26.84	123.8	3.79	3.21	1470.
225	4.08	33.84	223	26.88	120.2	4.09	3.87	1469.
250	3.98	33.86	248	26.91	117.9	4.39	4.59	1469.
300	3.90	33.94	298	26.98	111.4	4.97	6.20	1470.
400	3.82	34.04	397	27.07	103.7	6.04	10.01	1471.
500	3.64	34.13	496	27.16	95.8	7.03	14.55	1472.
600	3.47	34.21	595	27.23	89.3	7.96	19.75	1473.
800	3.13	34.31	792	27.35	79.3	9.64	31.73	1475.
1000	2.86	34.40	990	27.44	71.3	11.15	45.50	1478.
1200	2.59	34.46	1187	27.51	64.9	12.51	60.72	1480.


TEMPERATURE, C
0
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8
12
16
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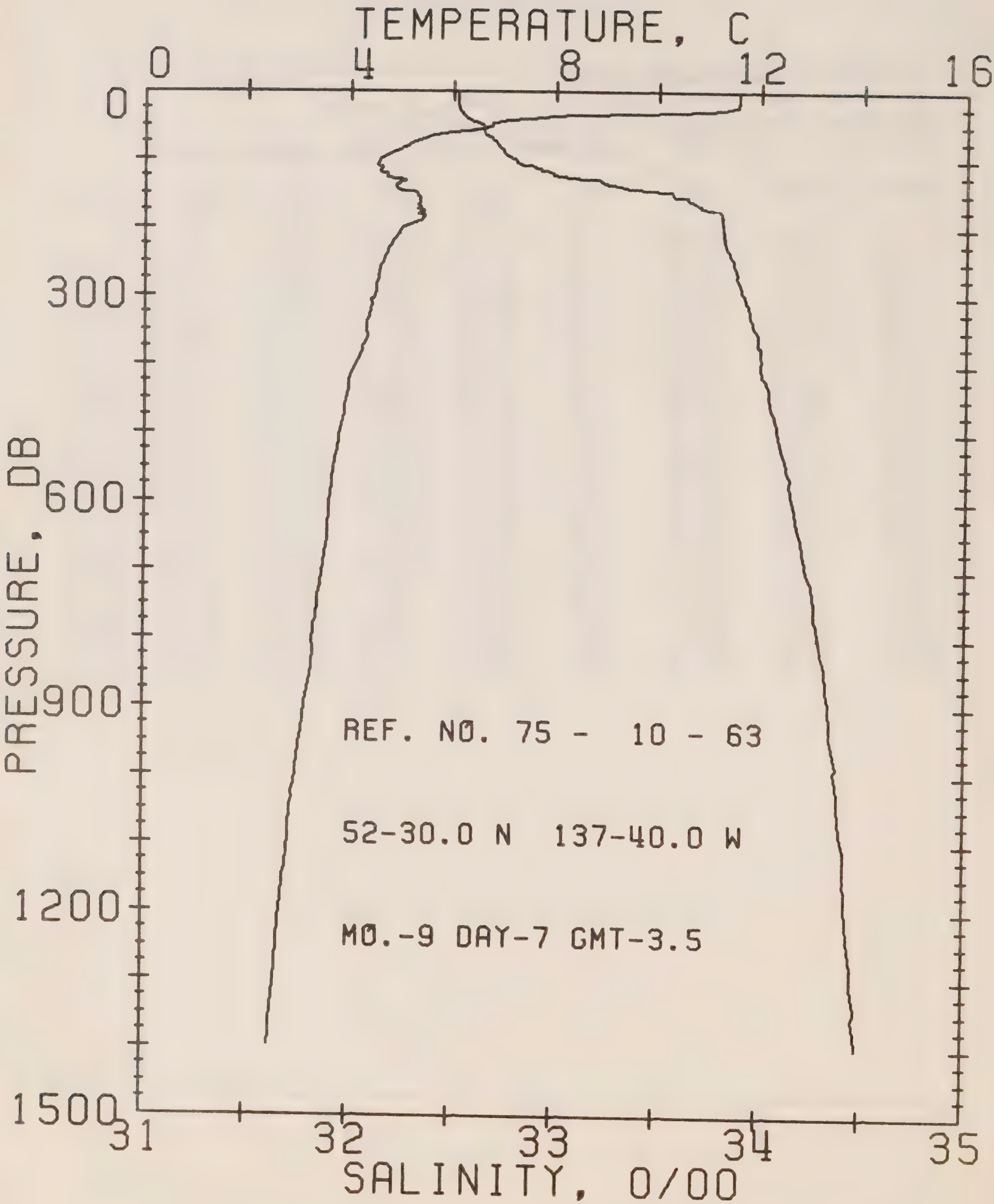
300
600
900
1200
1500
PRESSURE, DB
31
32
33
34
35
SALINITY, 0/00
REF. NO. 75 - 10 - 62
52-34.0 N 138-40.0 W
MO.-9 DAY-7 GMT-0.2

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 62 DATE 7/ 9/75
POSITION 52-34.0N, 138-40.0W GMT 0.2
RESULTS OF STP CAST 330 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.48	32.50	0	24.77	318.7	0.0	0.0	1493.
10	11.48	32.50	10	24.77	319.1	0.32	0.02	1493.
20	11.48	32.51	20	24.78	318.6	0.64	0.07	1493.
30	11.01	32.53	30	24.88	309.3	0.95	0.15	1491.
50	5.99	32.68	50	25.75	226.4	1.47	0.35	1473.
75	4.99	32.77	75	25.94	208.4	2.01	0.70	1469.
100	4.42	32.87	99	26.08	195.4	2.51	1.14	1467.
125	4.58	33.25	124	26.36	168.8	2.97	1.67	1469.
150	5.04	33.61	149	26.59	146.9	3.37	2.22	1472.
175	5.30	33.78	174	26.70	137.5	3.72	2.80	1473.
200	5.07	33.84	199	26.77	130.6	4.05	3.44	1473.
225	4.81	33.86	223	26.82	126.5	4.37	4.14	1472.
250	4.60	33.88	248	26.86	122.9	4.69	4.89	1472.
300	4.35	33.94	298	26.93	116.1	5.28	6.57	1472.
400	3.89	34.01	397	27.04	106.9	6.39	10.51	1472.
500	3.71	34.12	496	27.14	97.7	7.41	15.17	1473.
600	3.56	34.19	595	27.21	91.6	8.35	20.45	1474.
800	3.21	34.31	793	27.34	80.4	10.07	32.65	1476.
1000	2.90	34.39	990	27.43	72.3	11.59	46.56	1478.
1200	2.63	34.45	1187	27.50	66.0	12.97	62.00	1480.


TEMPERATURE, C
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16
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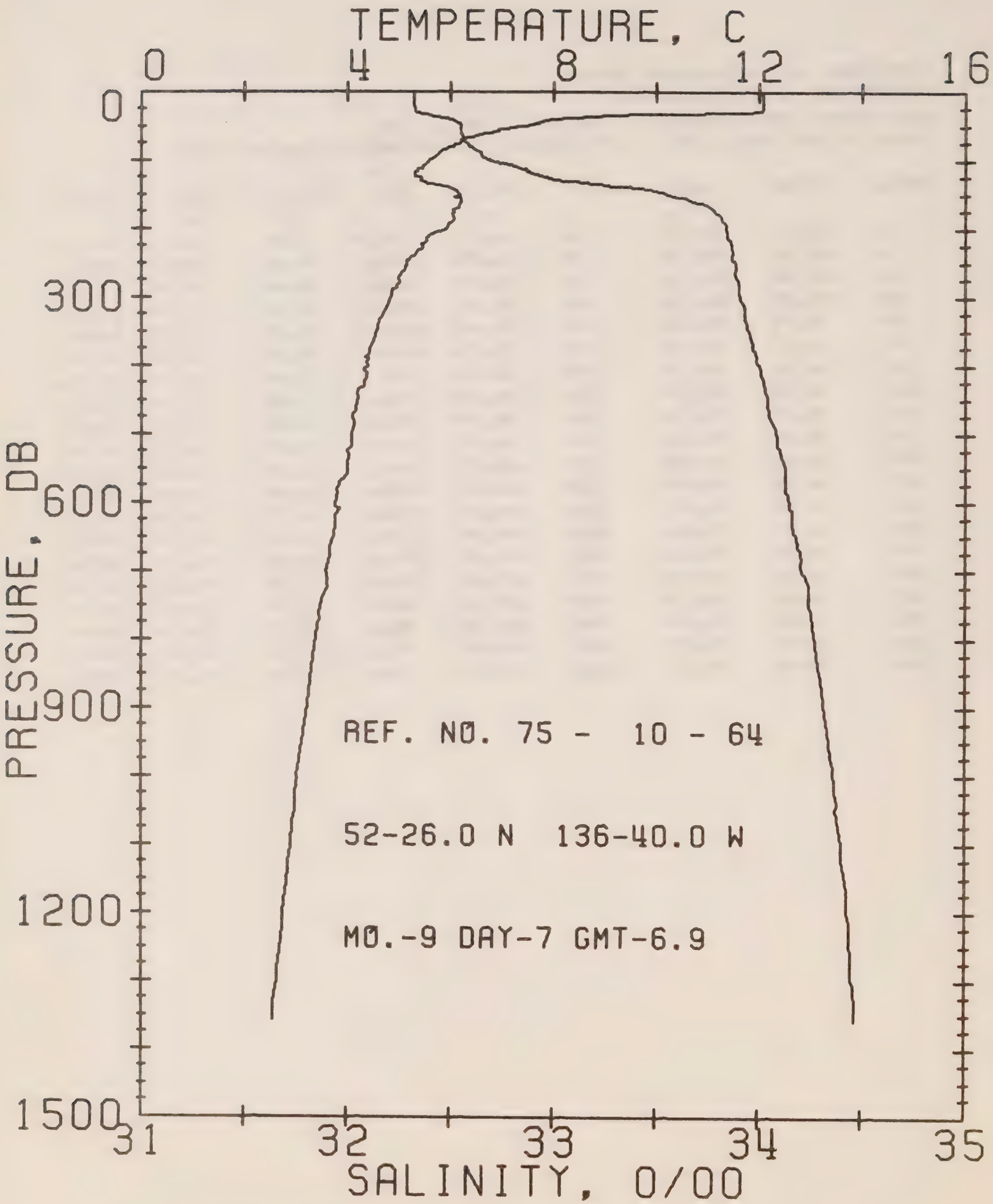
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 63
52-30.0 N 137-40.0 W
MO.-9 DAY-7 GMT-3.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 63 DATE 7/ 9/75
POSITION 52-30.0N, 137-40.0W GMT 3.5
RESULTS OF STP CAST 272 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.57	32.52	0	24.77	318.8	0.0	0.0	1493.
10	11.57	32.52	10	24.77	319.2	0.32	0.02	1493.
20	11.55	32.52	20	24.77	319.0	0.64	0.07	1493.
30	10.24	32.54	30	25.02	295.9	0.95	0.14	1489.
50	6.76	32.65	50	25.63	237.9	1.46	0.35	1476.
75	5.21	32.71	75	25.86	215.6	2.02	0.71	1470.
100	4.59	32.79	99	26.00	202.8	2.55	1.17	1468.
125	4.70	33.07	124	26.20	183.5	3.03	1.73	1469.
150	5.24	33.58	149	26.55	151.2	3.45	2.31	1473.
175	5.44	33.80	174	26.70	137.6	3.81	2.91	1474.
200	5.01	33.83	199	26.77	130.7	4.15	3.55	1473.
225	4.78	33.83	223	26.80	128.4	4.47	4.25	1472.
250	4.62	33.87	248	26.85	123.9	4.79	5.02	1472.
300	4.47	33.92	298	26.90	119.0	5.40	6.72	1472.
400	4.09	34.00	397	27.01	109.8	6.53	10.77	1472.
500	3.80	34.09	496	27.10	101.0	7.58	15.58	1473.
600	3.61	34.16	595	27.18	94.4	8.56	21.03	1474.
800	3.28	34.29	793	27.32	82.6	10.32	33.59	1476.
1000	2.97	34.37	990	27.41	74.2	11.89	47.91	1478.
1200	2.69	34.43	1188	27.48	68.1	13.30	63.76	1480.


TEMPERATURE, C
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300
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900
1200
1500
PRESSURE, DB
31
32
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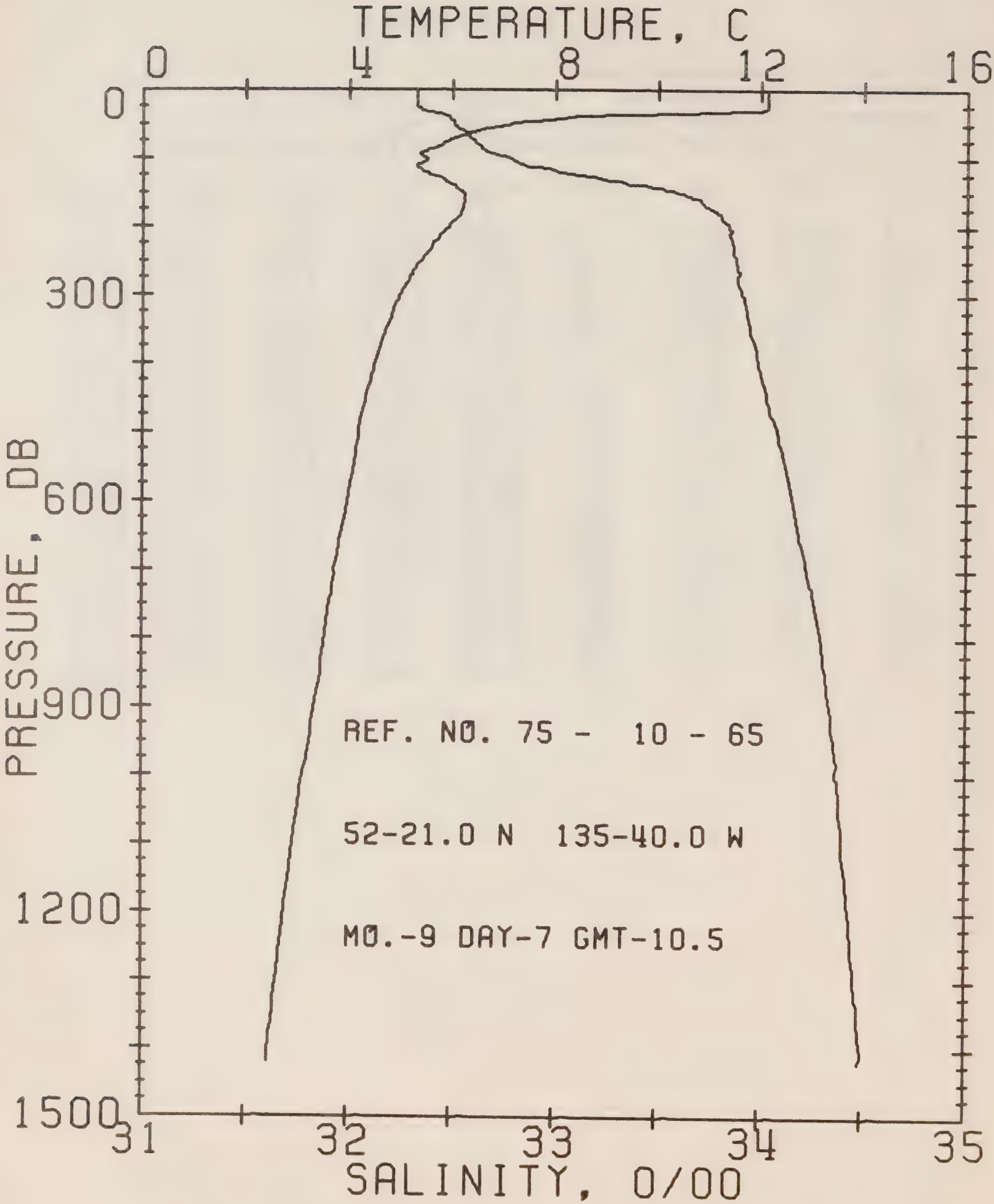
35
SALINITY, 0/00
REF. NO. 75 - 10 - 64
52-26.0 N 136-40.0 W
MO.-9 DAY-7 GMT-6.9

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 64 DATE 7/ 9/75
POSITION 52-26.0N, 136-40.0W GMT 6.9
RESULTS OF STP CAST 296 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.08	32.32	0	24.52	342.5	0.0	0.0	1494.
10	12.08	32.32	10	24.52	342.9	0.34	0.02	1495.
20	12.07	32.32	20	24.52	342.9	0.69	0.07	1495.
30	11.74	32.34	30	24.60	335.9	1.03	0.16	1494.
50	7.29	32.56	50	25.48	251.5	1.57	0.38	1478.
75	6.16	32.58	75	25.65	236.2	2.18	0.76	1474.
100	5.58	32.70	99	25.82	220.4	2.75	1.27	1472.
125	5.41	32.97	124	26.05	198.5	3.27	1.86	1472.
150	6.19	33.56	149	26.42	164.2	3.71	2.49	1476.
175	6.08	33.79	174	26.61	146.0	4.10	3.12	1477.
200	5.88	33.84	199	26.68	140.2	4.46	3.81	1476.
225	5.46	33.87	223	26.75	133.2	4.80	4.54	1475.
250	5.15	33.89	248	26.80	128.3	5.12	5.33	1474.
300	4.84	33.91	298	26.85	123.9	5.75	7.10	1474.
400	4.39	34.00	397	26.98	113.0	6.94	11.31	1474.
500	4.09	34.08	496	27.07	104.3	8.02	16.28	1474.
600	3.77	34.15	595	27.16	97.0	9.03	21.91	1475.
800	3.38	34.27	793	27.30	84.8	10.85	34.85	1476.
1000	3.03	34.36	990	27.40	75.9	12.45	49.54	1478.
1200	2.76	34.43	1188	27.48	68.9	13.90	65.72	1480.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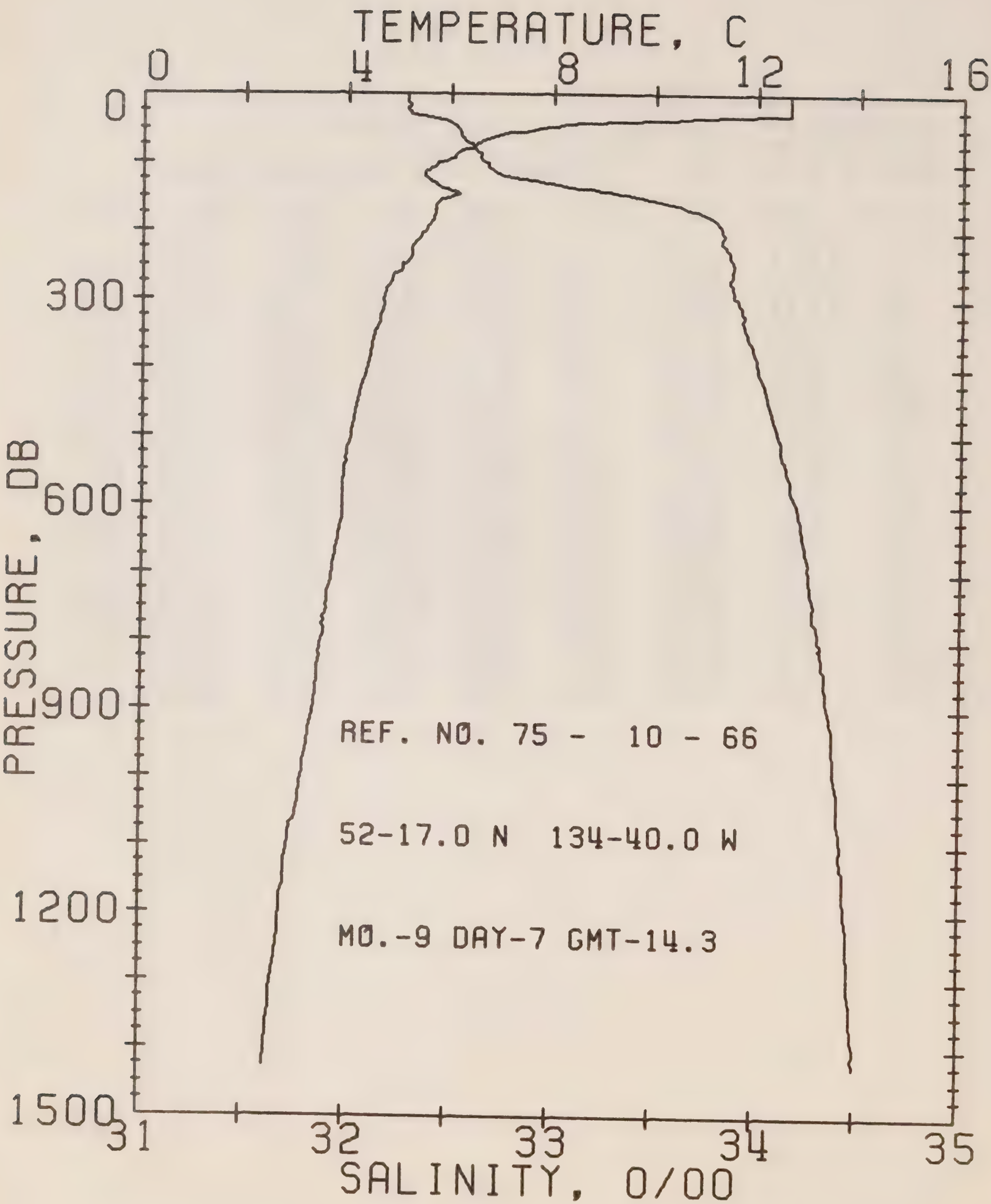
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 65
52-21.0 N 135-40.0 W
MO.-9 DAY-7 GMT-10.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 65 DATE 7/ 9/75
POSITION 52-21.0N, 135-40.0W GMT 10.5
RESULTS OF STP CAST 247 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.13	32.33	0	24.52	342.7	0.0	0.0	1495.
10	12.13	32.33	10	24.52	343.1	0.34	0.02	1495.
20	12.13	32.33	20	24.52	343.3	0.69	0.07	1495.
30	11.62	32.36	30	24.64	332.3	1.03	0.16	1493.
50	7.14	32.51	50	25.47	253.3	1.58	0.38	1477.
75	5.88	32.61	75	25.71	230.6	2.18	0.76	1473.
100	5.51	32.79	99	25.89	213.1	2.74	1.26	1472.
125	5.67	33.16	124	26.17	187.5	3.25	1.83	1473.
150	6.22	33.60	149	26.44	161.6	3.68	2.44	1477.
175	6.19	33.77	174	26.59	148.6	4.07	3.08	1477.
200	5.92	33.85	199	26.68	139.9	4.43	3.77	1477.
225	5.62	33.86	223	26.73	135.4	4.77	4.51	1476.
250	5.39	33.88	248	26.77	131.9	5.10	5.32	1475.
300	4.96	33.92	298	26.85	124.4	5.75	7.12	1474.
400	4.48	33.99	397	26.96	114.8	6.94	11.38	1474.
500	4.19	34.08	496	27.06	105.4	8.05	16.43	1475.
600	3.98	34.16	595	27.14	98.4	9.06	22.13	1475.
800	3.54	34.30	793	27.30	84.8	10.89	35.13	1477.
1000	3.12	34.37	990	27.40	76.3	12.50	49.81	1479.
1200	2.76	34.44	1188	27.48	68.6	13.94	65.99	1481.


TEMPERATURE, C
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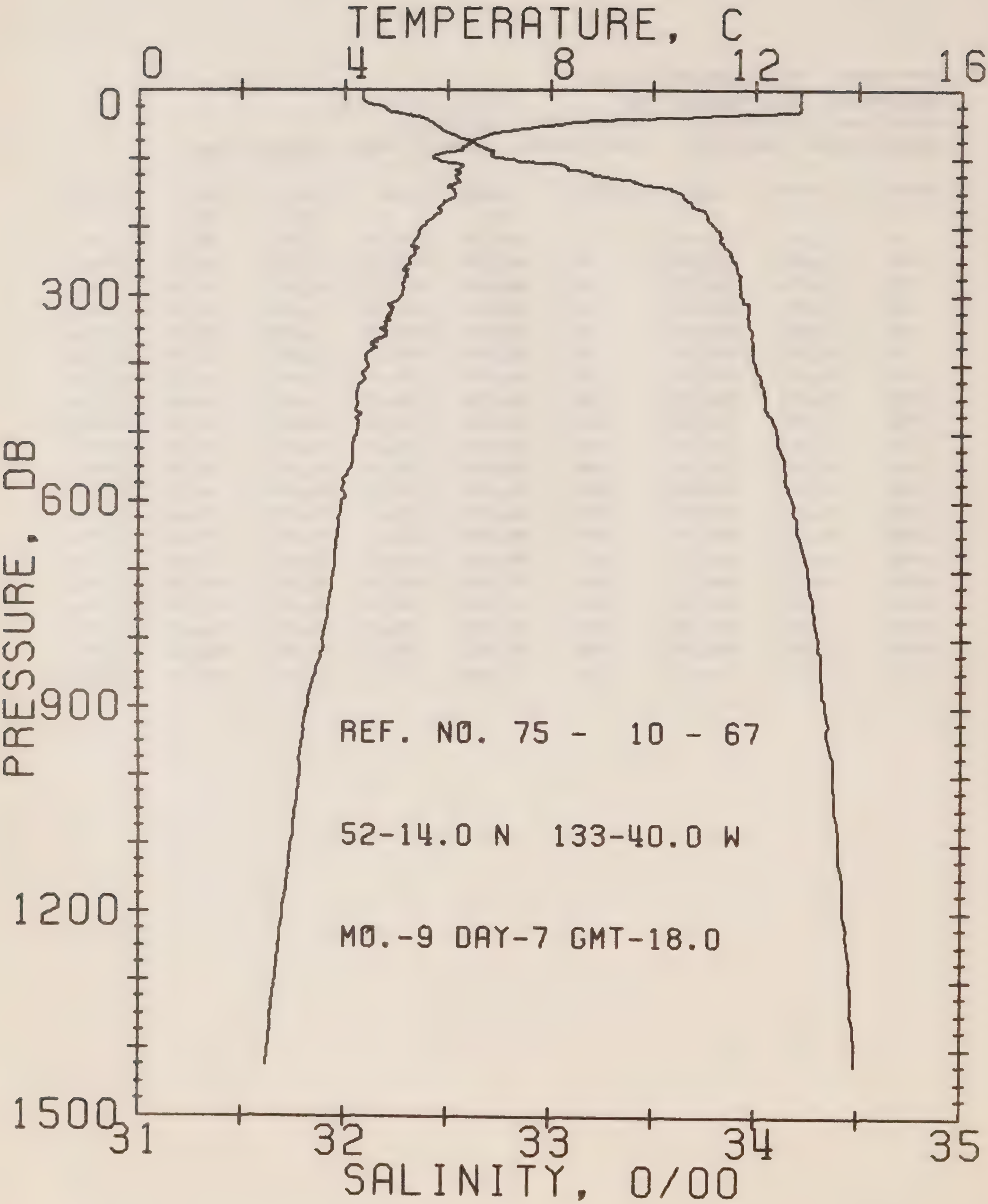
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 66
52-17.0 N 134-40.0 W
MO.-9 DAY-7 GMT-14.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 66 DATE 7/ 9/75
POSITION 52-17.0N, 134-40.0W GMT 14.3
RESULTS OF STP CAST 297 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.63	32.29	0	24.39	354.6	0.0	0.0	1496.
10	12.64	32.29	10	24.39	355.3	0.36	0.02	1496.
20	12.64	32.30	20	24.40	354.8	0.71	0.07	1497.
30	12.31	32.31	30	24.47	348.3	1.06	0.16	1496.
50	7.82	32.53	50	25.39	260.9	1.65	0.40	1480.
75	6.47	32.60	75	25.63	238.1	2.26	0.79	1475.
100	5.77	32.67	99	25.77	224.8	2.84	1.31	1473.
125	5.58	32.89	124	25.96	206.7	3.39	1.93	1473.
150	6.03	33.43	149	26.33	171.9	3.87	2.60	1476.
175	5.68	33.74	174	26.62	145.0	4.26	3.24	1475.
200	5.50	33.83	199	26.71	136.6	4.61	3.91	1475.
225	5.23	33.85	223	26.76	132.0	4.94	4.63	1474.
250	5.12	33.88	248	26.80	128.7	5.27	5.42	1474.
300	4.70	33.91	298	26.87	122.2	5.90	7.18	1473.
400	4.38	34.01	397	26.98	112.5	7.07	11.37	1474.
500	4.08	34.11	496	27.09	102.4	8.14	16.27	1474.
600	3.91	34.20	595	27.18	94.6	9.13	21.79	1475.
800	3.51	34.31	793	27.32	83.2	10.91	34.46	1477.
1000	3.15	34.39	990	27.41	74.8	12.49	48.89	1479.
1200	2.73	34.45	1188	27.49	67.2	13.90	64.69	1480.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16
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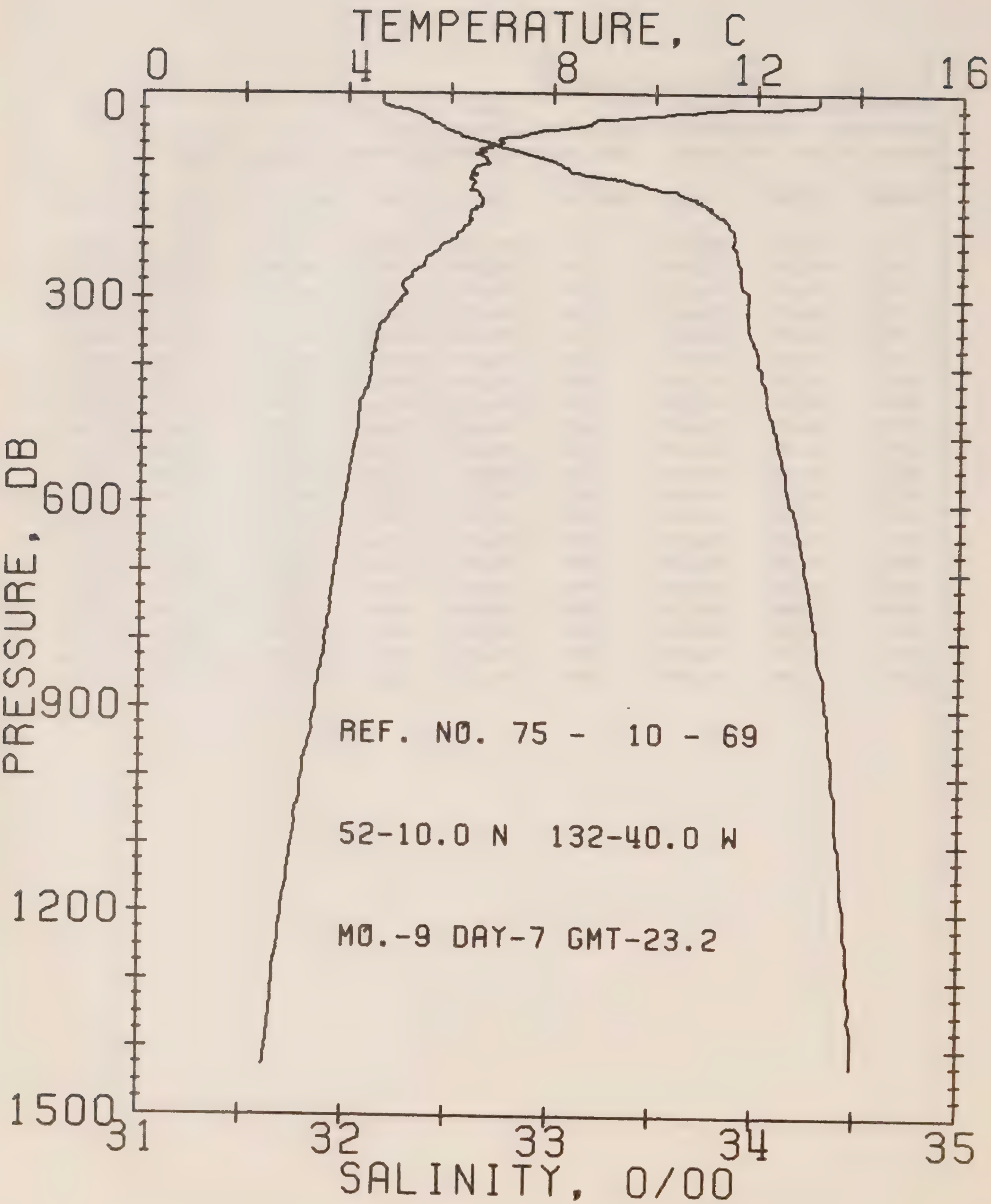
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 67
52-14.0 N 133-40.0 W
MO.-9 DAY-7 GMT-18.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 67 DATE 7/ 9/75
POSITION 52-14.0N, 133-40.0W GMT 18.0
RESULTS OF STP CAST 356 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.88	32.09	0	24.19	374.0	0.0	0.0	1497.
10	12.87	32.09	10	24.19	374.2	0.37	0.02	1497.
20	12.87	32.13	20	24.22	371.7	0.75	0.08	1497.
30	12.83	32.22	30	24.30	364.5	1.12	0.17	1497.
50	8.07	32.44	50	25.28	270.6	1.74	0.42	1481.
75	6.50	32.63	75	25.64	236.6	2.37	0.82	1475.
100	5.74	32.81	99	25.88	214.3	2.93	1.32	1473.
125	6.16	33.26	124	26.18	185.9	3.44	1.90	1475.
150	6.15	33.63	149	26.48	158.5	3.86	2.49	1476.
175	5.87	33.74	174	26.60	147.0	4.24	3.12	1476.
200	5.48	33.81	199	26.70	137.6	4.60	3.80	1475.
225	5.31	33.84	223	26.75	133.6	4.94	4.54	1474.
250	5.24	33.89	248	26.79	129.4	5.27	5.33	1475.
300	5.11	33.93	298	26.84	125.4	5.90	7.11	1475.
400	4.46	34.00	397	26.97	113.9	7.08	11.32	1474.
500	4.23	34.10	496	27.07	104.5	8.17	16.29	1475.
600	3.94	34.18	595	27.16	96.4	9.17	21.92	1475.
800	3.58	34.31	793	27.30	84.5	10.98	34.79	1477.
1000	3.14	34.38	990	27.40	75.7	12.58	49.38	1479.
1200	2.80	34.43	1188	27.47	69.4	14.03	65.59	1481.


TEMPERATURE, C
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4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 69
52-10.0 N 132-40.0 W
MO.-9 DAY-7 GMT-23.2
31
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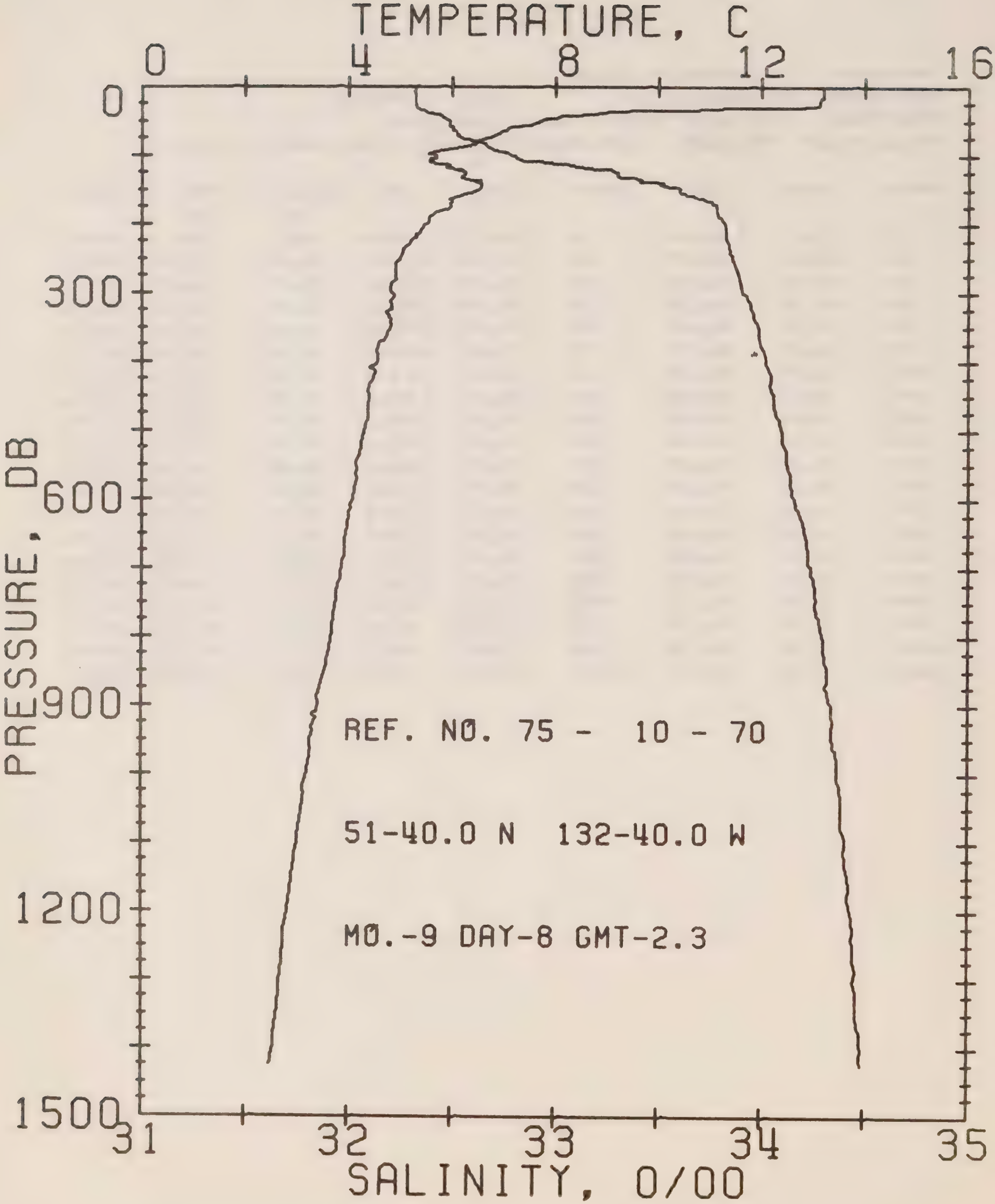
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 69 DATE 7/ 9/75
POSITION 52-10.0N, 132-40.0W GMT 23.2
RESULTS OF STP CAST 378 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.19	32.16	0	24.18	374.6	0.0	0.0	1498.
10	13.19	32.17	10	24.19	374.3	0.37	0.02	1498.
20	12.62	32.21	20	24.33	361.0	0.75	0.08	1496.
30	10.33	32.34	30	24.85	312.1	1.08	0.16	1489.
50	8.40	32.47	50	25.25	273.5	1.65	0.39	1482.
75	6.91	32.71	75	25.65	235.8	2.28	0.79	1477.
100	6.74	33.00	99	25.91	212.1	2.83	1.28	1477.
125	6.37	33.33	124	26.21	183.3	3.34	1.86	1476.
150	6.56	33.65	149	26.44	162.2	3.77	2.46	1478.
175	6.40	33.79	174	26.57	149.6	4.16	3.11	1478.
200	6.23	33.88	199	26.67	141.3	4.52	3.80	1478.
225	5.81	33.89	223	26.73	135.8	4.87	4.55	1477.
250	5.49	33.91	248	26.78	130.6	5.20	5.35	1476.
300	5.08	33.96	298	26.87	122.9	5.83	7.12	1475.
400	4.49	34.02	397	26.98	112.7	7.01	11.30	1474.
500	4.21	34.10	496	27.07	104.5	8.09	16.27	1475.
600	3.96	34.17	595	27.16	97.4	9.10	21.92	1475.
800	3.61	34.30	793	27.30	85.2	10.91	34.83	1477.
1000	3.18	34.38	990	27.40	76.1	12.52	49.52	1479.
1200	2.79	34.45	1188	27.49	67.9	13.96	65.66	1481.


TEMPERATURE, C
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PRESSURE, DB
REF. NO. 75 - 10 - 70
51-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-2.3
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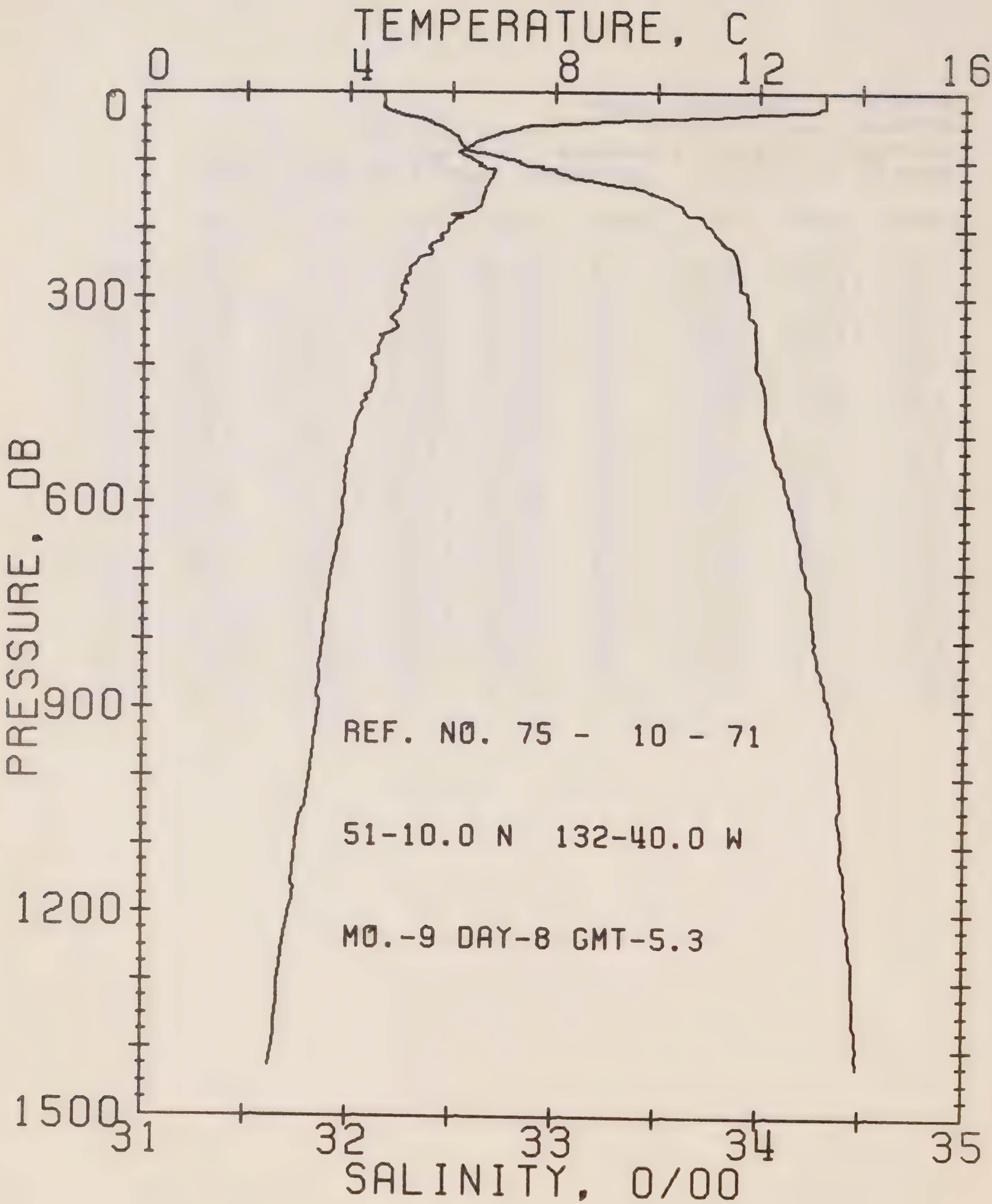
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 70 DATE 8/ 9/75
POSITION 51-40.0N, 132-40.0W GMT 2.3
RESULTS OF STP CAST 360 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.21	32.32	0	24.30	363.2	0.0	0.0	1498.
10	13.21	32.32	10	24.30	363.6	0.36	0.02	1498.
20	13.13	32.32	20	24.32	362.5	0.73	0.07	1498.
30	11.44	32.33	30	24.64	331.4	1.09	0.17	1493.
50	7.65	32.49	50	25.38	261.6	1.66	0.40	1479.
75	6.64	32.56	75	25.57	243.5	2.29	0.80	1476.
100	5.68	32.79	99	25.88	214.7	2.86	1.30	1473.
125	6.24	33.30	124	26.20	184.0	3.35	1.87	1476.
150	6.51	33.60	149	26.41	165.2	3.79	2.48	1478.
175	5.95	33.78	174	26.62	145.1	4.17	3.12	1476.
200	5.49	33.82	199	26.71	136.9	4.52	3.79	1475.
225	5.20	33.83	223	26.75	132.7	4.86	4.51	1474.
250	4.98	33.85	248	26.79	129.5	5.19	5.31	1473.
300	4.82	33.91	298	26.86	123.6	5.82	7.07	1474.
400	4.54	34.02	397	26.97	113.3	7.00	11.26	1474.
500	4.30	34.10	496	27.06	105.6	8.09	16.27	1475.
600	4.06	34.16	595	27.14	99.3	9.11	22.01	1476.
800	3.66	34.30	793	27.29	86.2	10.95	35.10	1478.
1000	3.17	34.37	990	27.39	76.8	12.58	49.98	1479.
1200	2.81	34.43	1188	27.48	69.2	14.04	66.33	1481.


TEMPERATURE, C
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PRESSURE, DB
REF. NO. 75 - 10 - 71
51-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-5.3
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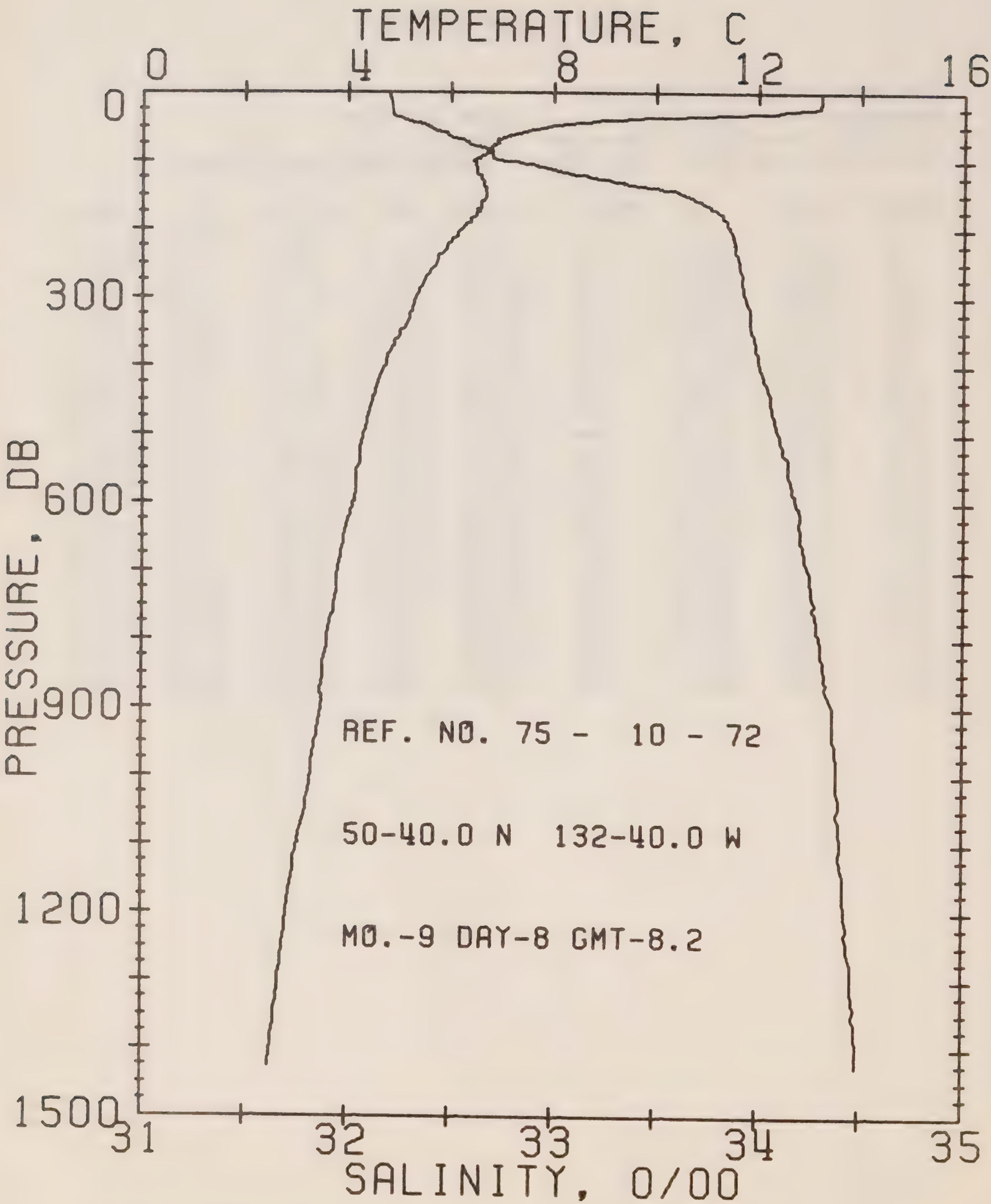
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 71 DATE 8/ 9/75
POSITION 51-10.0N, 132-40.0W GMT 5.3
RESULTS OF STP CAST 362 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.28	32.16	0	24.16	376.3	0.0	0.0	1498.
10	13.27	32.17	10	24.17	375.8	0.38	0.02	1498.
20	13.20	32.17	20	24.19	374.8	0.75	0.08	1498.
30	12.09	32.23	30	24.45	350.2	1.12	0.17	1495.
50	7.40	32.45	50	25.38	261.2	1.72	0.41	1478.
75	6.40	32.54	75	25.59	242.0	2.35	0.81	1475.
100	6.43	32.82	99	25.80	221.8	2.93	1.33	1476.
125	6.76	33.09	124	25.97	206.2	3.47	1.94	1478.
150	6.60	33.50	149	26.32	173.8	3.93	2.60	1478.
175	6.31	33.63	174	26.46	160.7	4.35	3.29	1477.
200	5.93	33.77	199	26.61	146.2	4.73	4.01	1476.
225	5.55	33.85	223	26.72	135.7	5.09	4.78	1475.
250	5.29	33.88	248	26.78	130.6	5.42	5.58	1475.
300	5.07	33.94	298	26.85	124.2	6.05	7.36	1475.
400	4.46	33.98	397	26.95	115.4	7.24	11.59	1474.
500	4.09	34.05	496	27.04	107.1	8.35	16.68	1474.
600	3.87	34.15	595	27.15	98.1	9.38	22.40	1475.
800	3.50	34.27	793	27.28	86.2	11.20	35.41	1477.
1000	3.25	34.39	990	27.40	76.2	12.82	50.18	1479.
1200	2.85	34.43	1188	27.47	69.9	14.28	66.52	1481.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PRESSURE, DB
REF. NO. 75 - 10 - 72
50-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-8.2
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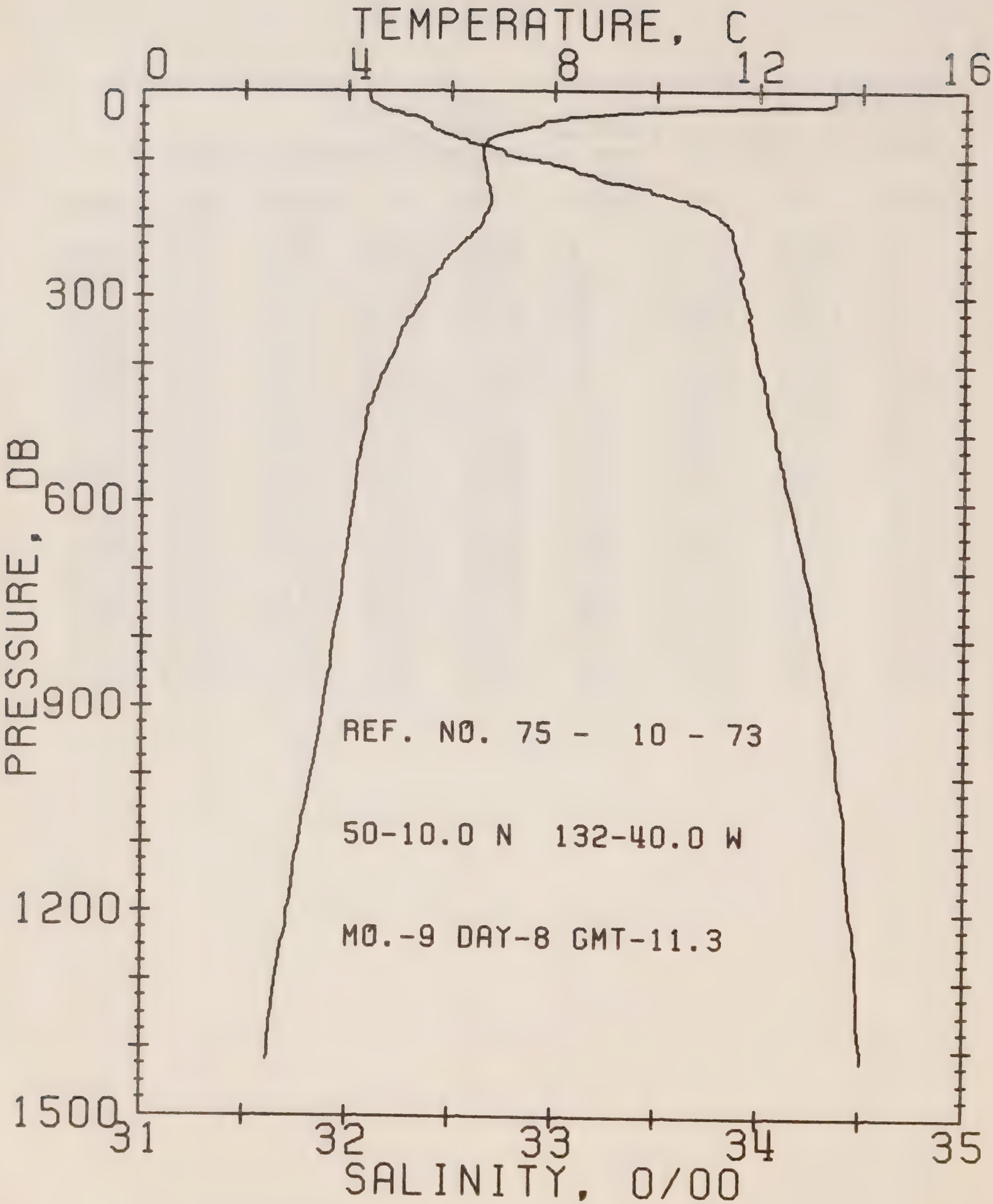
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 72 DATE 8/ 9/75
POSITION 50-40.0N, 132-40.0W GMT 8.2
RESULTS OF STP CAST 396 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.23	32.20	0	24.21	372.4	0.0	0.0	1498.
10	13.23	32.21	10	24.21	372.5	0.37	0.02	1498.
20	13.20	32.24	20	24.24	369.8	0.74	0.08	1498.
30	11.99	32.24	30	24.47	347.6	1.10	0.17	1494.
50	7.92	32.40	50	25.27	271.9	1.71	0.41	1480.
75	6.87	32.59	75	25.56	244.2	2.35	0.82	1477.
100	6.44	32.78	99	25.77	224.9	2.93	1.34	1476.
125	6.61	33.22	124	26.09	194.6	3.46	1.94	1477.
150	6.68	33.64	149	26.42	164.5	3.90	2.55	1478.
175	6.52	33.82	174	26.58	149.3	4.29	3.20	1478.
200	6.19	33.86	199	26.65	142.5	4.65	3.90	1478.
225	5.93	33.89	223	26.71	137.4	5.00	4.65	1477.
250	5.71	33.91	248	26.75	133.5	5.34	5.47	1477.
300	5.31	33.94	298	26.82	127.0	5.99	7.30	1476.
400	4.71	34.01	397	26.95	115.9	7.21	11.63	1475.
500	4.30	34.10	496	27.07	105.2	8.31	16.67	1475.
600	4.09	34.19	595	27.16	97.4	9.32	22.35	1476.
800	3.60	34.30	793	27.30	85.1	11.15	35.33	1477.
1000	3.29	34.39	990	27.40	76.7	12.76	50.06	1479.
1200	2.83	34.43	1188	27.47	69.8	14.22	66.48	1481.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PRESSURE, DB
REF. NO. 75 - 10 - 73
50-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-11.3
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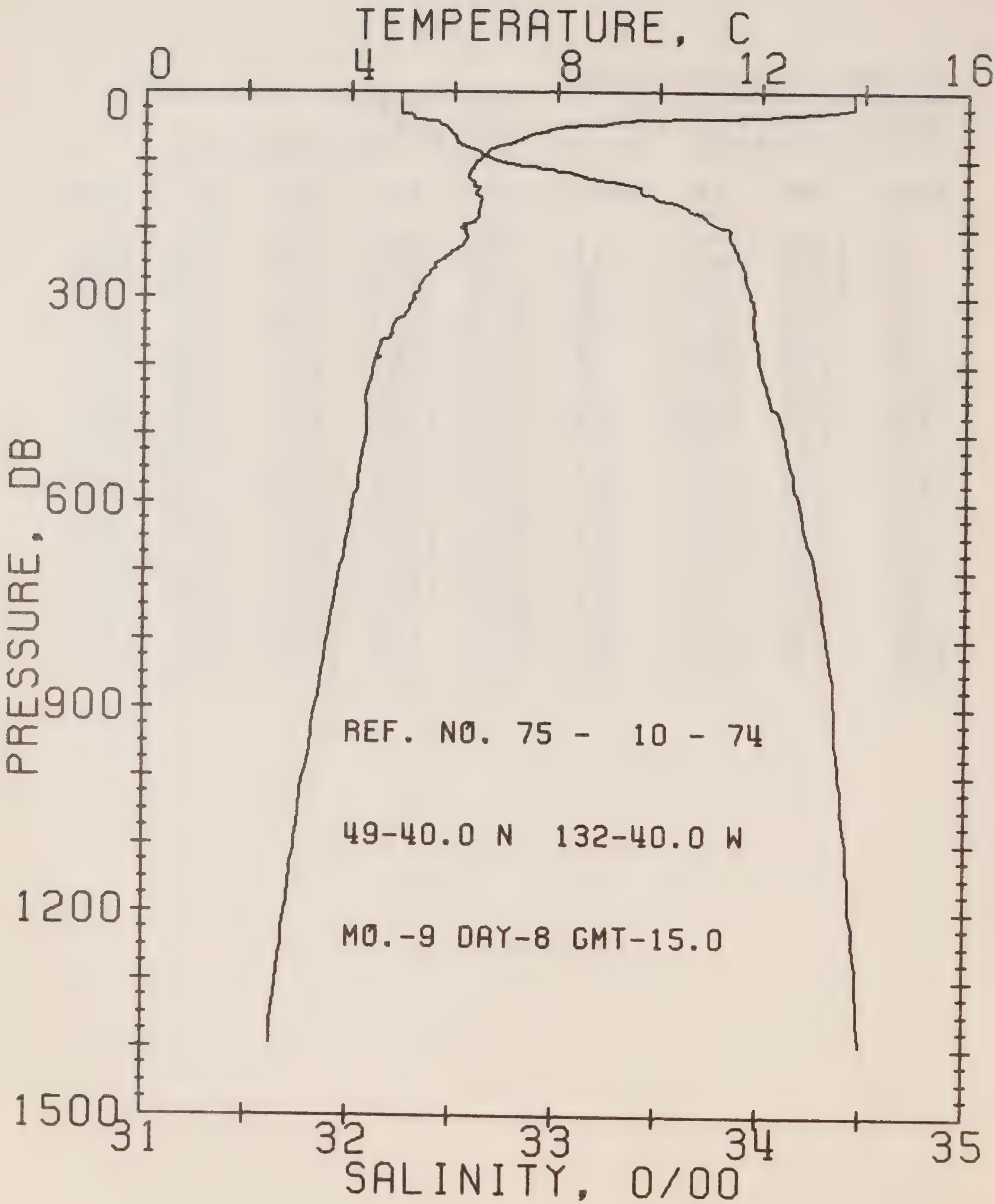
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 73 DATE 8/ 9/75
POSITION 50-10.0N, 132-40.0W GMT 11.3
RESULTS OF STP CAST 229 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.46	32.10	0	24.08	384.1	0.0	0.0	1499.
10	13.46	32.10	10	24.08	384.6	0.38	0.02	1499.
20	13.30	32.14	20	24.15	378.4	0.77	0.08	1499.
30	9.79	32.24	30	24.86	311.0	1.11	0.17	1487.
50	7.73	32.40	50	25.30	269.3	1.68	0.39	1479.
75	6.68	32.59	75	25.59	241.8	2.31	0.80	1476.
100	6.63	32.90	99	25.84	218.3	2.89	1.31	1476.
125	6.70	33.20	124	26.07	197.3	3.41	1.90	1478.
150	6.77	33.52	149	26.31	174.5	3.87	2.55	1479.
175	6.69	33.75	174	26.50	156.6	4.28	3.23	1479.
200	6.51	33.86	199	26.61	146.6	4.66	3.95	1479.
225	6.17	33.88	223	26.67	141.2	5.02	4.73	1478.
250	5.86	33.91	248	26.73	135.6	5.36	5.57	1477.
300	5.48	33.93	298	26.80	129.8	6.03	7.42	1476.
400	4.76	34.00	397	26.93	117.3	7.25	11.79	1475.
500	4.33	34.08	496	27.05	107.3	8.37	16.90	1475.
600	4.11	34.16	595	27.13	99.9	9.41	22.71	1476.
800	3.72	34.29	793	27.28	87.2	11.28	36.01	1478.
1000	3.30	34.38	990	27.39	77.3	12.92	51.01	1479.
1200	2.84	34.45	1188	27.49	68.4	14.36	67.21	1481.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PRESSURE, DB
REF. NØ. 75 - 10 - 74
49-40.0 N 132-40.0 W
MØ.-9 DAY-8 GMT-15.0
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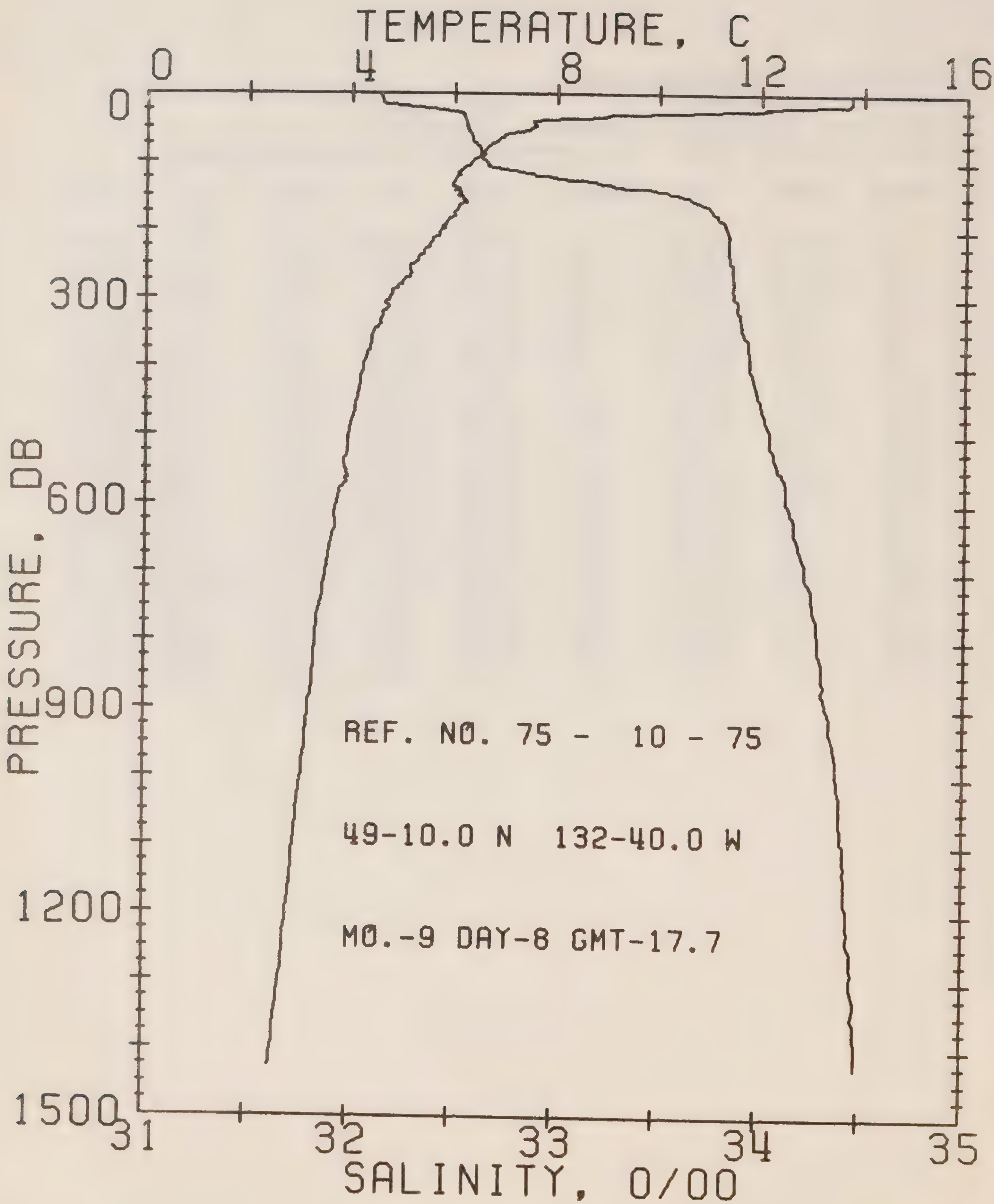
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 74   DATE 8/ 9/75
POSITION 49-40.0N, 132-40.0W   GMT 15.0
RESULTS OF STP CAST   234 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.78	32.24	0	24.13	380.0	0.0	0.0	1500.
10	13.78	32.24	10	24.13	380.5	0.38	0.02	1500.
20	13.78	32.24	20	24.13	380.7	0.76	0.08	1500.
30	12.83	32.24	30	24.31	362.9	1.14	0.17	1497.
50	8.16	32.46	50	25.28	270.8	1.76	0.42	1481.
75	7.05	32.53	75	25.49	251.0	2.41	0.84	1477.
100	6.47	32.70	99	25.70	231.3	3.01	1.37	1476.
125	6.28	33.14	124	26.08	196.0	3.54	1.97	1476.
150	6.43	33.42	149	26.28	177.7	3.99	2.61	1477.
175	6.46	33.67	174	26.47	159.8	4.41	3.31	1478.
200	6.21	33.86	199	26.65	142.8	4.79	4.03	1478.
225	6.13	33.87	223	26.67	141.4	5.15	4.80	1478.
250	5.63	33.90	248	26.75	133.3	5.49	5.63	1476.
300	5.23	33.95	298	26.84	125.4	6.14	7.44	1475.
400	4.44	33.99	397	26.96	114.1	7.33	11.69	1474.
500	4.31	34.11	496	27.07	104.6	8.42	16.69	1475.
600	4.06	34.19	595	27.16	97.1	9.43	22.35	1476.
800	3.57	34.33	793	27.32	82.8	11.22	35.08	1477.
1000	3.12	34.39	990	27.41	74.7	12.80	49.49	1479.
1200	2.77	34.44	1188	27.49	68.2	14.22	65.43	1481.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PRESSURE, DB
REF. NO. 75 - 10 - 75
49-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-17.7
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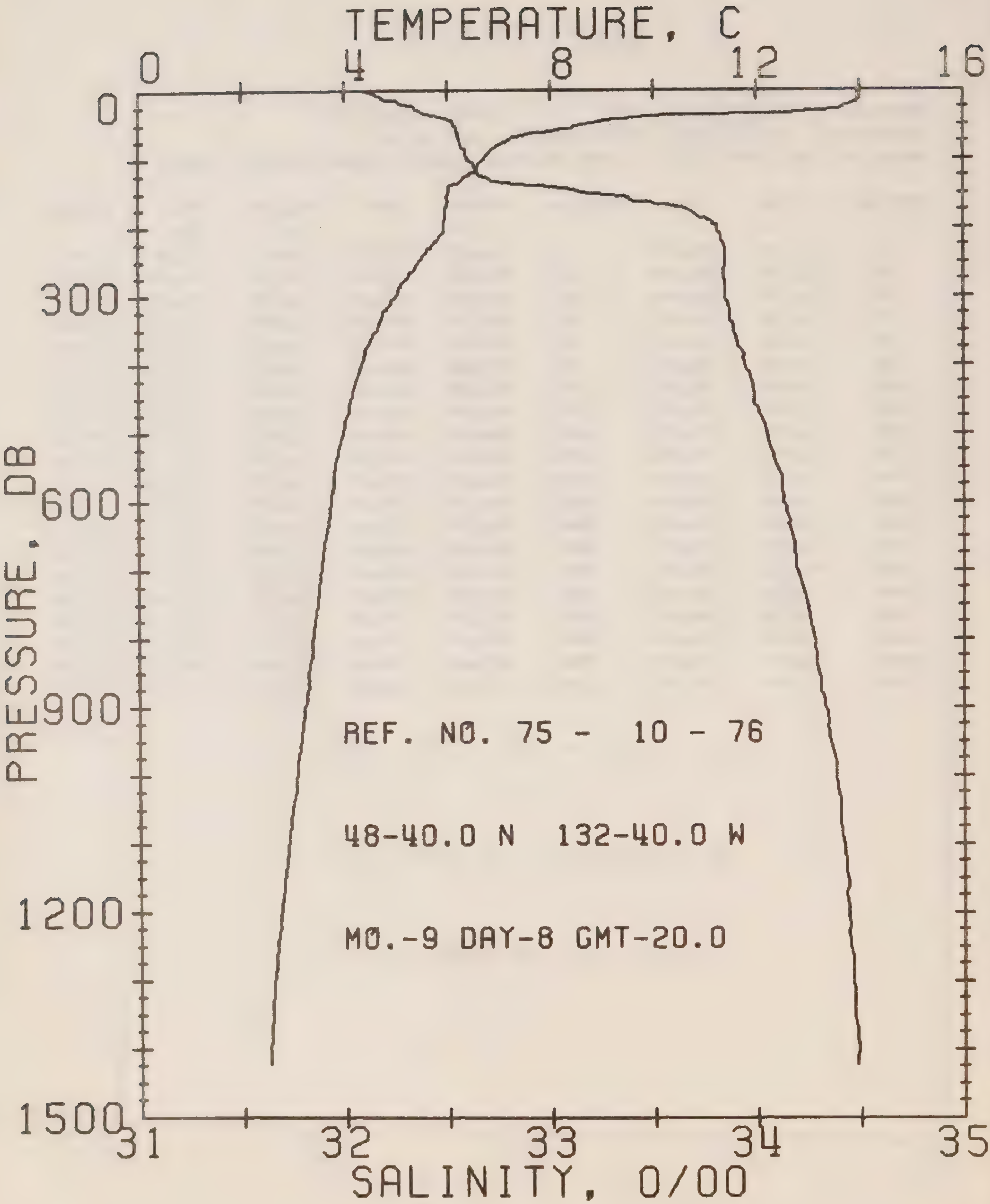
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 75 DATE 8/ 9/75
POSITION 49-10.0N, 132-40.0W GMT 17.7
RESULTS OF STP CAST 347 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.76	32.13	0	24.05	387.7	0.0	0.0	1500.
10	13.75	32.15	10	24.06	386.7	0.39	0.02	1500.
20	12.09	32.34	20	24.53	341.9	0.76	0.08	1495.
30	9.10	32.53	30	25.19	278.9	1.08	0.16	1484.
50	7.52	32.55	50	25.44	255.3	1.60	0.37	1479.
75	6.70	32.61	75	25.60	240.5	2.22	0.76	1476.
100	6.32	32.66	99	25.69	232.6	2.81	1.29	1475.
125	5.99	33.08	124	26.06	197.4	3.36	1.92	1475.
150	6.06	33.63	149	26.49	157.4	3.80	2.53	1476.
175	6.00	33.78	174	26.61	145.8	4.18	3.16	1476.
200	5.77	33.84	199	26.69	138.8	4.53	3.83	1476.
225	5.49	33.84	223	26.72	135.7	4.87	4.58	1475.
250	5.20	33.86	248	26.77	131.1	5.21	5.38	1474.
300	4.76	33.88	298	26.84	125.2	5.85	7.18	1473.
400	4.24	33.95	397	26.95	115.1	7.05	11.44	1473.
500	3.96	34.05	496	27.06	105.5	8.15	16.49	1474.
600	3.72	34.13	595	27.15	97.5	9.17	22.19	1474.
800	3.33	34.29	793	27.31	83.1	10.96	34.92	1476.
1000	3.07	34.38	990	27.41	74.6	12.54	49.38	1478.
1200	2.80	34.44	1188	27.48	68.6	13.97	65.38	1481.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PRESSURE, DB
REF. NO. 75 - 10 - 76
48-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-20.0
31
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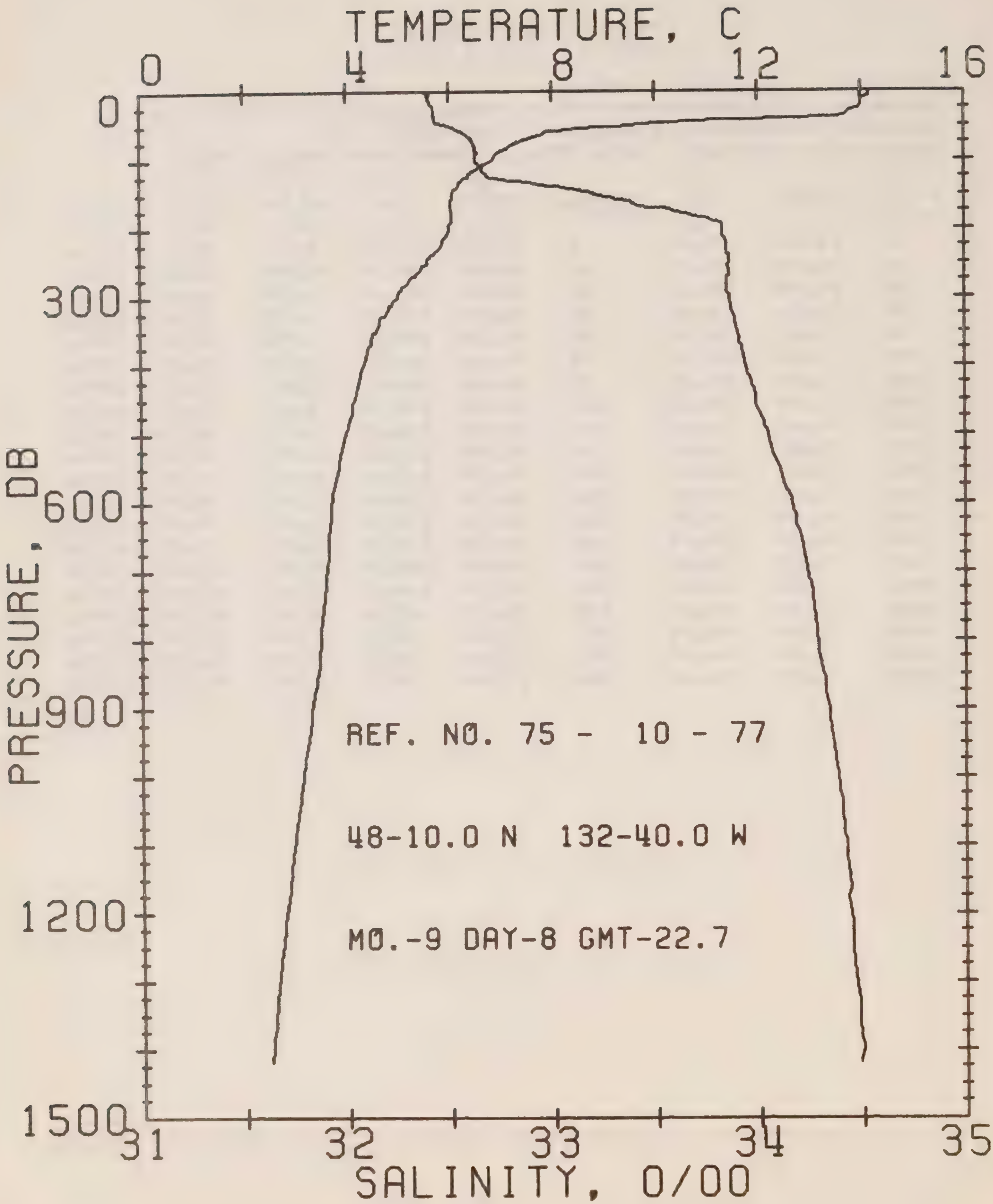
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 76 DATE 8/ 9/75
POSITION 48-40.0N, 132-40.0W GMT 20.0
RESULTS OF STP CAST 273 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.97	32.09	0	23.97	394.7	0.0	0.0	1500.
10	13.96	32.18	10	24.04	388.4	0.39	0.02	1501.
20	13.79	32.30	20	24.17	376.5	0.78	0.08	1500.
30	13.21	32.37	30	24.34	360.5	1.15	0.17	1499.
50	8.63	32.53	50	25.27	272.3	1.75	0.41	1483.
75	7.11	32.58	75	25.52	248.0	2.39	0.82	1478.
100	6.69	32.60	99	25.60	241.1	3.00	1.37	1476.
125	6.33	32.68	124	25.71	231.4	3.60	2.05	1475.
150	6.01	33.20	149	26.16	188.9	4.13	2.79	1475.
175	5.95	33.67	174	26.54	153.1	4.55	3.48	1476.
200	5.92	33.81	199	26.65	142.9	4.92	4.19	1476.
225	5.69	33.84	224	26.70	138.2	5.27	4.95	1476.
250	5.45	33.85	248	26.74	134.8	5.61	5.77	1475.
300	4.99	33.85	298	26.79	130.0	6.27	7.63	1474.
400	4.32	33.94	397	26.94	116.7	7.50	12.01	1473.
500	3.96	34.05	496	27.06	105.6	8.61	17.08	1474.
600	3.73	34.13	595	27.15	97.8	9.62	22.74	1474.
800	3.37	34.28	793	27.30	84.5	11.44	35.69	1476.
1000	3.05	34.38	991	27.41	74.8	13.03	50.25	1478.
1200	2.73	34.44	1188	27.49	68.0	14.45	66.13	1480.



TEMPERATURE, C
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PRESSURE, DB
REF. NO. 75 - 10 - 77
48-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-22.7
31
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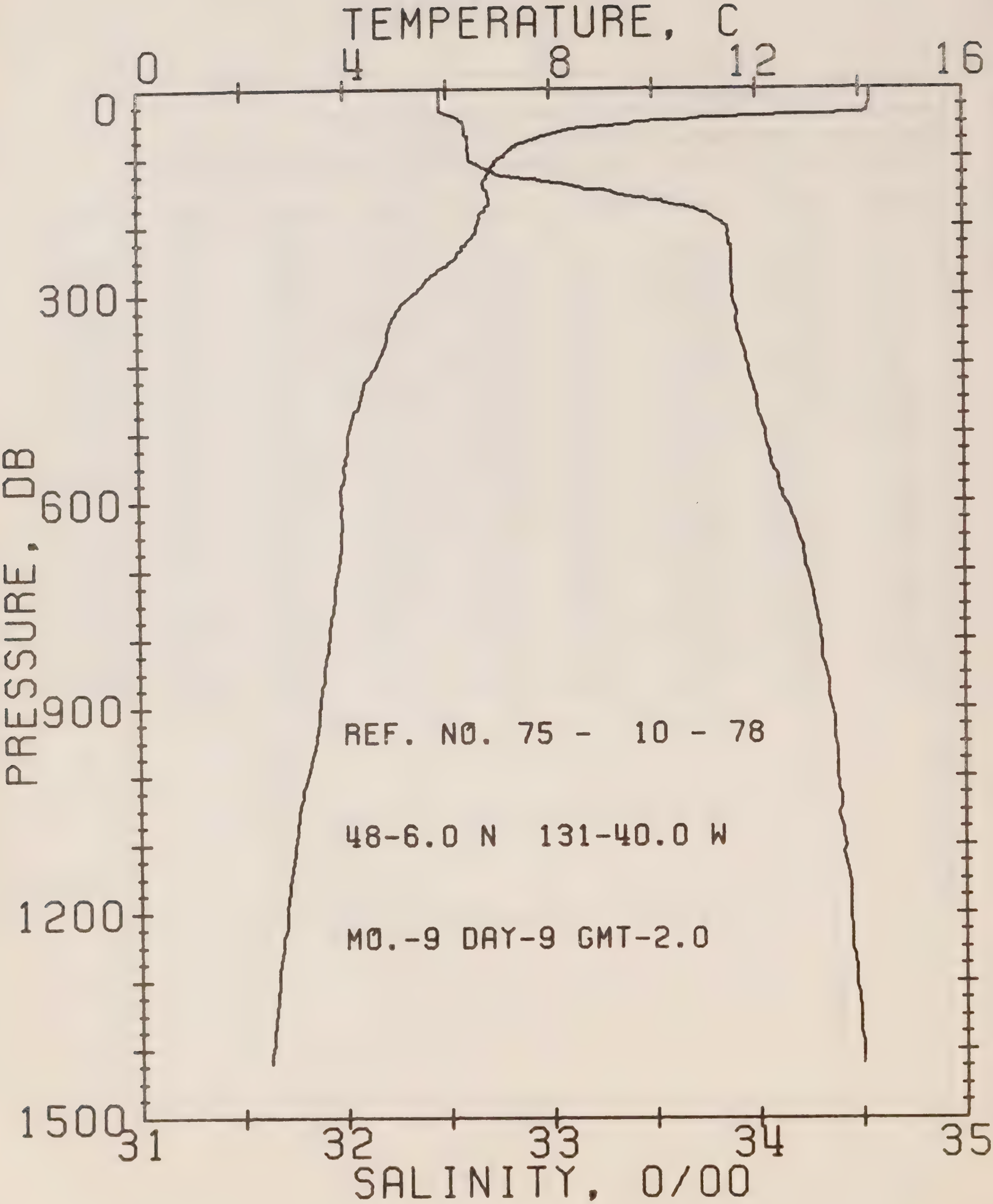
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 77 DATE 8/ 9/75
POSITION 48-10.0N, 132-40.0W GMT 22.7
RESULTS OF STP CAST 259 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.16	32.39	0	24.16	376.4	0.0	0.0	1501.
10	14.05	32.40	10	24.19	374.1	0.38	0.02	1501.
20	13.98	32.41	20	24.22	371.8	0.75	0.08	1501.
30	13.75	32.43	30	24.28	366.5	1.12	0.17	1501.
50	9.39	32.50	50	25.13	285.5	1.79	0.44	1486.
75	7.29	32.61	75	25.52	248.1	2.44	0.85	1478.
100	6.82	32.63	99	25.60	240.9	3.05	1.39	1477.
125	6.34	32.70	124	25.72	229.9	3.63	2.07	1475.
150	6.05	33.20	149	26.15	189.5	4.15	2.79	1475.
175	6.04	33.59	174	26.46	160.1	4.59	3.51	1476.
200	6.00	33.83	199	26.65	142.4	4.96	4.22	1477.
225	5.83	33.85	224	26.69	139.1	5.31	4.98	1477.
250	5.56	33.86	248	26.73	135.4	5.65	5.81	1476.
300	4.98	33.86	298	26.80	129.2	6.32	7.67	1474.
400	4.31	33.94	397	26.93	116.8	7.54	12.02	1473.
500	3.97	34.05	496	27.06	105.8	8.65	17.12	1474.
600	3.69	34.16	595	27.18	95.1	9.66	22.76	1474.
800	3.48	34.28	793	27.29	85.1	11.45	35.48	1477.
1000	3.12	34.38	991	27.41	75.4	13.05	50.16	1479.
1200	2.79	34.44	1188	27.48	68.3	14.48	66.18	1481.


TEMPERATURE, C
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4
8
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16
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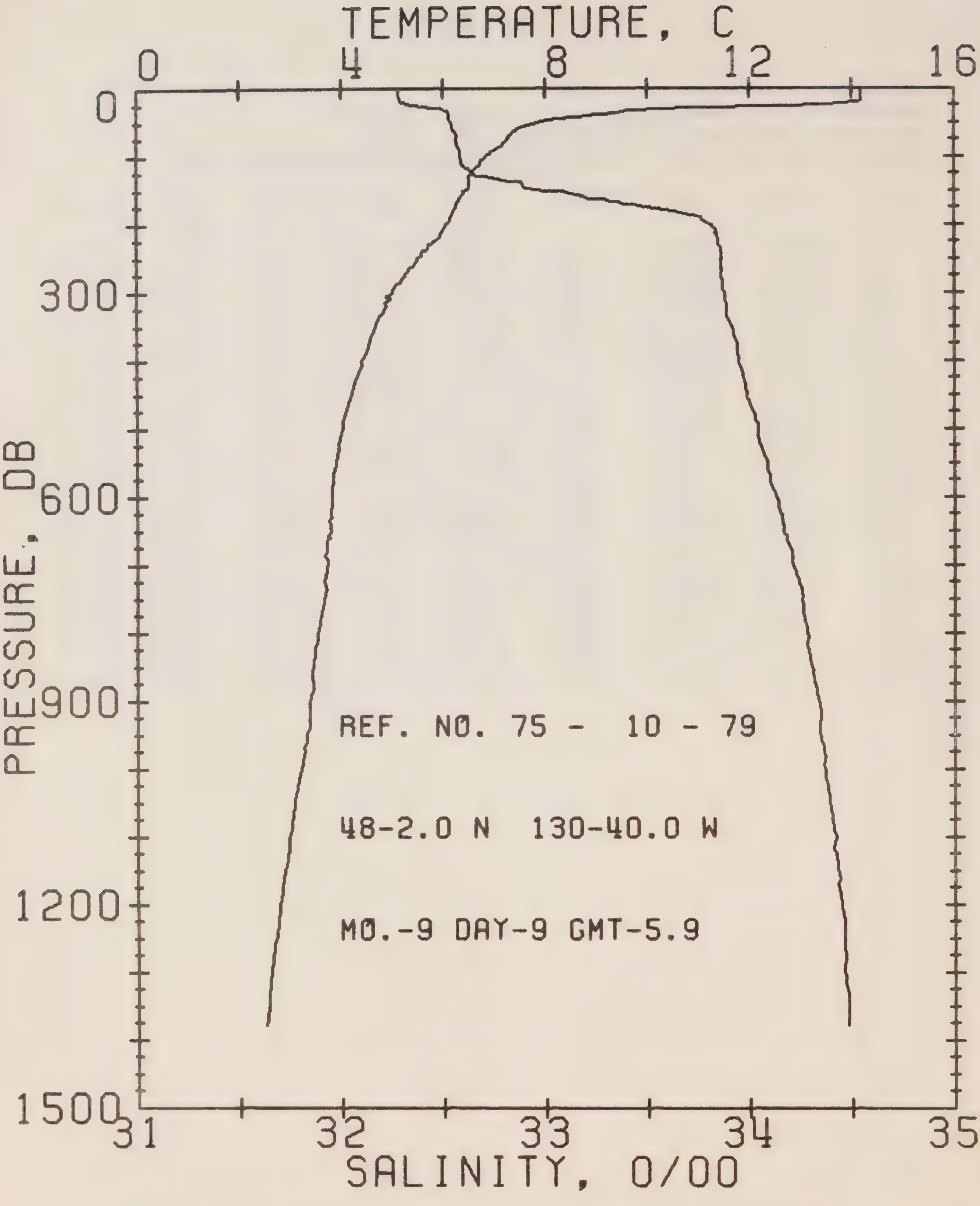
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 78
48-6.0 N 131-40.0 W
MO.-9 DAY-9 GMT-2.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 78 DATE 9/ 9/75
POSITION 48- 6.0N. 131-40.0W GMT 2.0
RESULTS OF STP CAST 320 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.21	32.46	0	24.21	372.3	0.0	0.0	1502.
10	14.21	32.47	10	24.21	372.0	0.37	0.02	1502.
20	14.20	32.47	20	24.22	372.0	0.74	0.08	1502.
30	14.15	32.47	30	24.23	371.4	1.12	0.17	1502.
50	9.62	32.58	50	25.15	283.5	1.77	0.43	1487.
75	7.58	32.60	75	25.48	252.7	2.43	0.85	1479.
100	7.04	32.61	99	25.56	245.2	3.05	1.41	1478.
125	6.78	32.77	124	25.72	230.2	3.65	2.09	1477.
150	6.80	33.30	149	26.13	191.3	4.17	2.82	1478.
175	6.74	33.70	174	26.46	160.8	4.61	3.54	1479.
200	6.57	33.86	199	26.60	147.4	4.99	4.28	1479.
225	6.35	33.87	224	26.64	144.2	5.36	5.07	1479.
250	6.10	33.88	248	26.68	140.6	5.71	5.93	1478.
300	5.32	33.89	298	26.78	130.9	6.39	7.82	1476.
400	4.62	33.95	397	26.91	119.0	7.63	12.26	1475.
500	4.06	34.04	496	27.04	107.3	8.76	17.42	1474.
600	3.92	34.14	595	27.13	99.3	9.80	23.25	1475.
800	3.67	34.30	793	27.29	85.8	11.64	36.31	1478.
1000	3.22	34.38	991	27.40	76.4	13.26	51.12	1479.
1200	2.83	34.44	1188	27.48	69.1	14.70	67.27	1481.


TEMPERATURE, C
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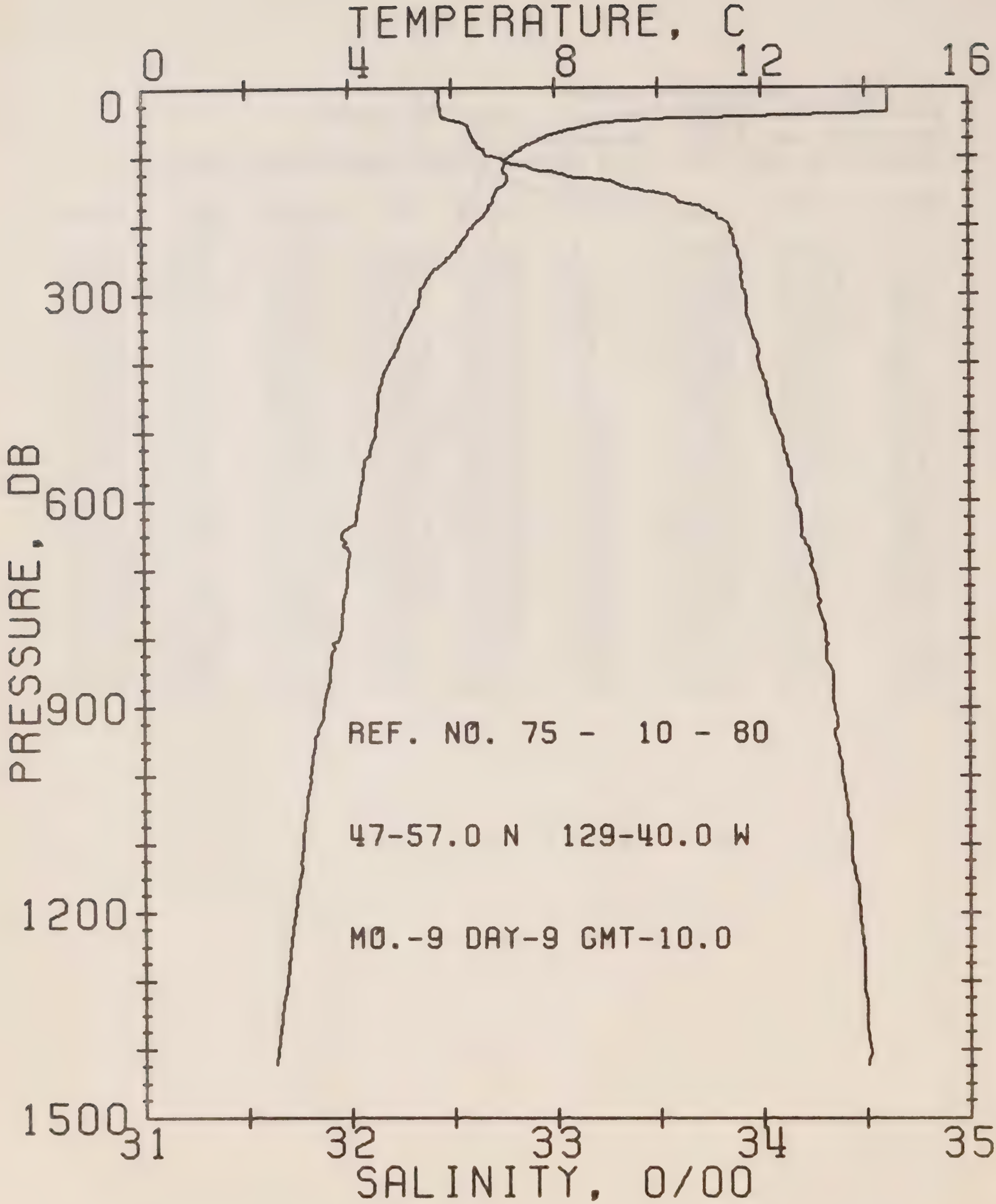
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 79
48-2.0 N 130-40.0 W
MO.-9 DAY-9 GMT-5.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 79 DATE 9/ 9/75
POSITION 48- 2.0N, 130-40.0W GMT 5.9
RESULTS OF STP CAST 306 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.19	32.28	0	24.07	385.1	0.0	0.0	1501.
10	14.19	32.28	10	24.07	385.6	0.39	0.02	1502.
20	14.14	32.30	20	24.10	383.4	0.77	0.08	1502.
30	10.24	32.50	30	24.99	298.9	1.11	0.17	1489.
50	7.79	32.54	50	25.40	259.7	1.66	0.39	1480.
75	7.22	32.57	75	25.50	250.3	2.30	0.79	1478.
100	6.84	32.57	99	25.55	245.6	2.92	1.34	1477.
125	6.57	32.64	124	25.64	237.3	3.52	2.04	1476.
150	6.38	33.06	149	26.00	203.8	4.08	2.81	1476.
175	6.23	33.53	174	26.39	167.3	4.54	3.58	1477.
200	6.04	33.81	199	26.63	144.4	4.92	4.31	1477.
225	5.81	33.85	224	26.69	138.8	5.28	5.08	1476.
250	5.49	33.86	248	26.74	134.3	5.62	5.90	1476.
300	4.98	33.88	298	26.81	127.6	6.27	7.74	1474.
400	4.40	33.95	397	26.93	116.9	7.50	12.10	1474.
500	4.01	34.04	496	27.05	106.8	8.62	17.22	1474.
600	3.82	34.13	595	27.14	98.7	9.64	22.98	1475.
800	3.52	34.28	793	27.29	85.7	11.49	36.07	1477.
1000	3.20	34.37	991	27.39	77.4	13.11	50.97	1479.
1200	2.78	34.45	1188	27.49	67.9	14.56	67.16	1481.


TEMPERATURE, C
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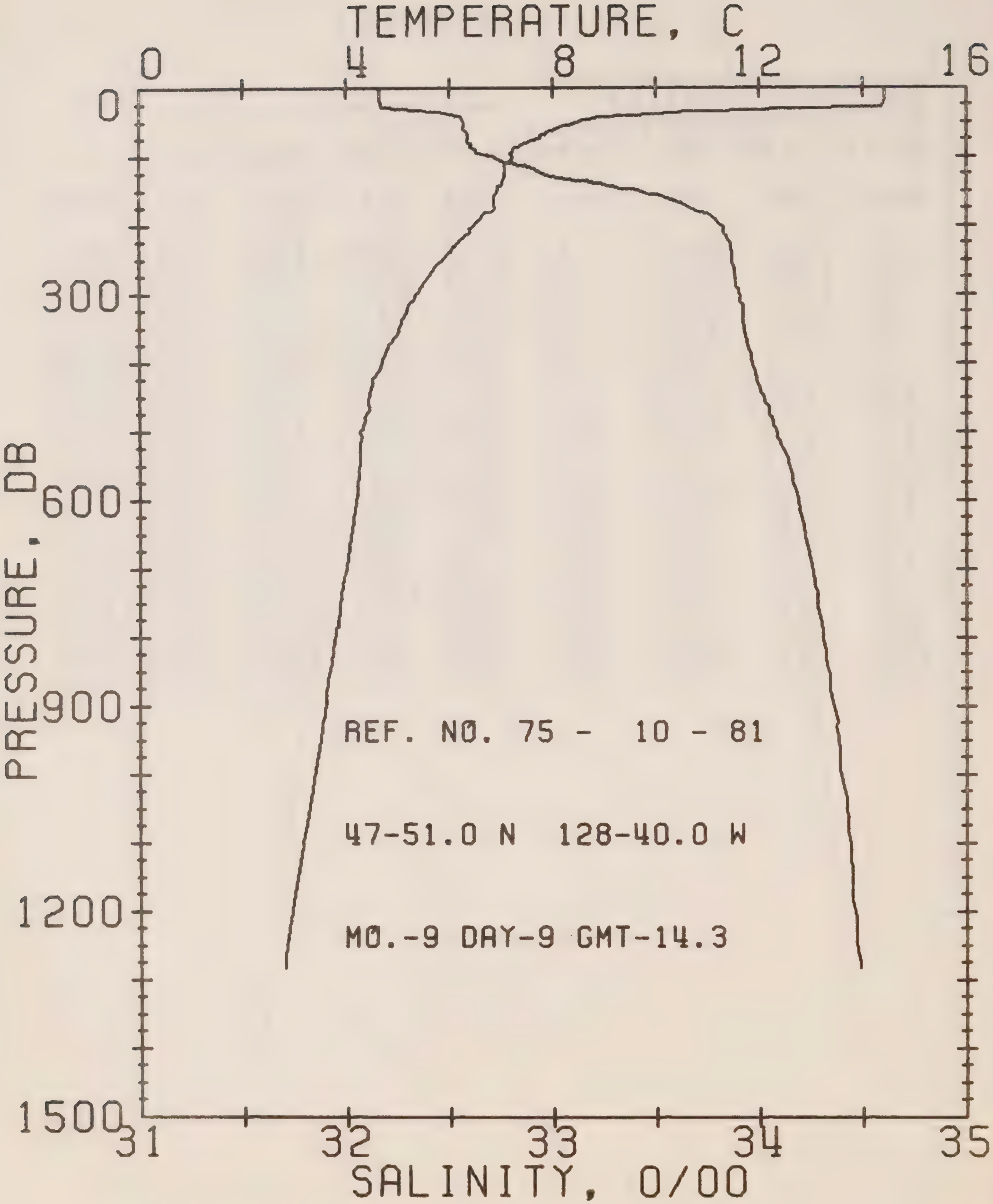
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 75 - 10 - 80
47-57.0 N 129-40.0 W
MO.-9 DAY-9 GMT-10.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 80 DATE 9/ 9/75
POSITION 47-57.0N, 129-40.0W GMT 10.0
RESULTS OF STP CAST 346 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.45	32.44	0	24.14	378.5	0.0	0.0	1502.
10	14.46	32.44	10	24.14	379.1	0.38	0.02	1503.
20	14.45	32.44	20	24.14	379.2	0.76	0.08	1503.
30	14.45	32.45	30	24.15	378.7	1.14	0.17	1503.
50	8.93	32.56	50	25.24	274.4	1.81	0.44	1484.
75	7.71	32.61	75	25.46	253.8	2.46	0.86	1480.
100	7.14	32.71	99	25.62	239.0	3.08	1.41	1478.
125	7.07	33.04	124	25.90	213.5	3.65	2.06	1479.
150	6.86	33.46	149	26.25	180.3	4.14	2.74	1479.
175	6.71	33.73	174	26.48	158.5	4.56	3.44	1479.
200	6.42	33.85	199	26.62	146.2	4.94	4.17	1478.
225	6.18	33.87	224	26.66	141.9	5.30	4.95	1478.
250	5.89	33.90	248	26.72	136.8	5.65	5.79	1477.
300	5.39	33.92	298	26.80	129.5	6.31	7.65	1476.
400	4.77	33.99	397	26.92	118.4	7.55	12.06	1475.
500	4.50	34.09	496	27.03	108.7	8.68	17.25	1476.
600	4.18	34.17	595	27.13	99.8	9.72	23.07	1476.
800	3.77	34.31	793	27.29	86.5	11.58	36.26	1478.
1000	3.21	34.38	991	27.40	76.4	13.20	51.10	1479.
1200	2.91	34.47	1188	27.49	67.8	14.63	67.19	1481.


TEMPERATURE, C
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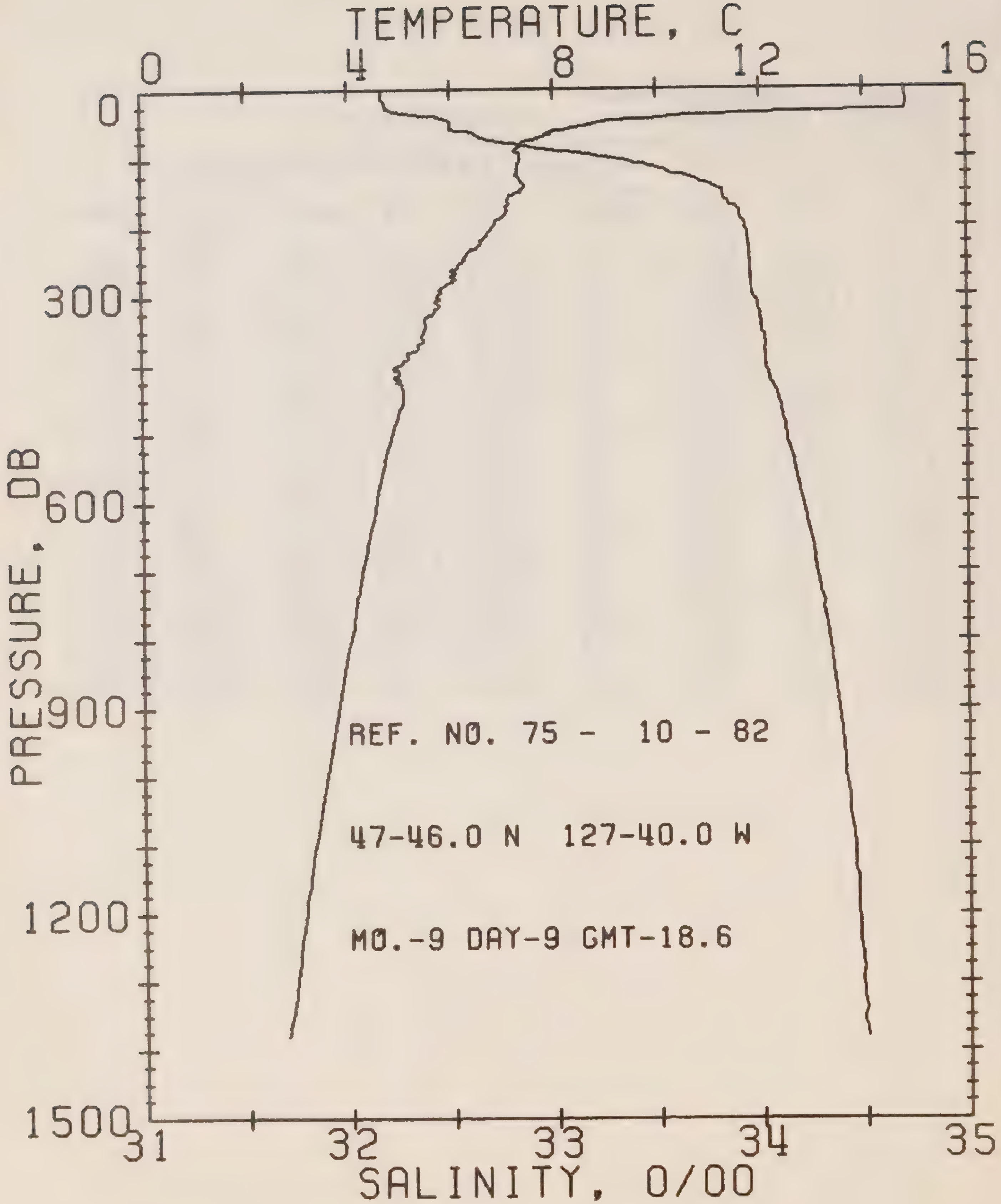
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 75 - 10 - 81
47-51.0 N 128-40.0 W
MØ.-9 DAY-9 GMT-14.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 81   DATE 9/ 9/75
POSITION 47-51.0N, 128-40.0W   GMT 14.3
RESULTS OF STP CAST   265 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.42	32.16	0	23.93	398.5	0.0	0.0	1502.
10	14.43	32.16	10	23.93	399.0	0.40	0.02	1502.
20	14.40	32.16	20	23.94	398.7	0.80	0.08	1502.
30	12.58	32.26	30	24.38	356.8	1.19	0.18	1497.
50	8.46	32.57	50	25.32	266.9	1.77	0.42	1482.
75	7.65	32.59	75	25.46	254.5	2.42	0.83	1480.
100	7.22	32.71	99	25.61	239.8	3.04	1.38	1479.
125	7.06	32.97	124	25.84	219.0	3.61	2.03	1479.
150	6.90	33.43	149	26.22	183.1	4.11	2.74	1479.
175	6.85	33.68	174	26.42	164.1	4.54	3.45	1480.
200	6.45	33.82	199	26.59	148.7	4.93	4.19	1479.
225	6.13	33.86	224	26.66	142.1	5.30	4.98	1478.
250	5.86	33.87	248	26.70	138.3	5.65	5.83	1477.
300	5.34	33.90	298	26.79	130.3	6.32	7.71	1476.
400	4.68	33.97	397	26.92	118.9	7.56	12.14	1475.
500	4.28	34.08	496	27.05	106.6	8.69	17.29	1475.
600	4.19	34.19	595	27.14	98.8	9.71	23.02	1476.
800	3.78	34.31	793	27.29	86.5	11.56	36.17	1478.
1000	3.37	34.40	991	27.39	77.1	13.19	51.10	1480.
1200	2.93	34.46	1188	27.49	68.7	14.64	67.31	1481.


TEMPERATURE, C
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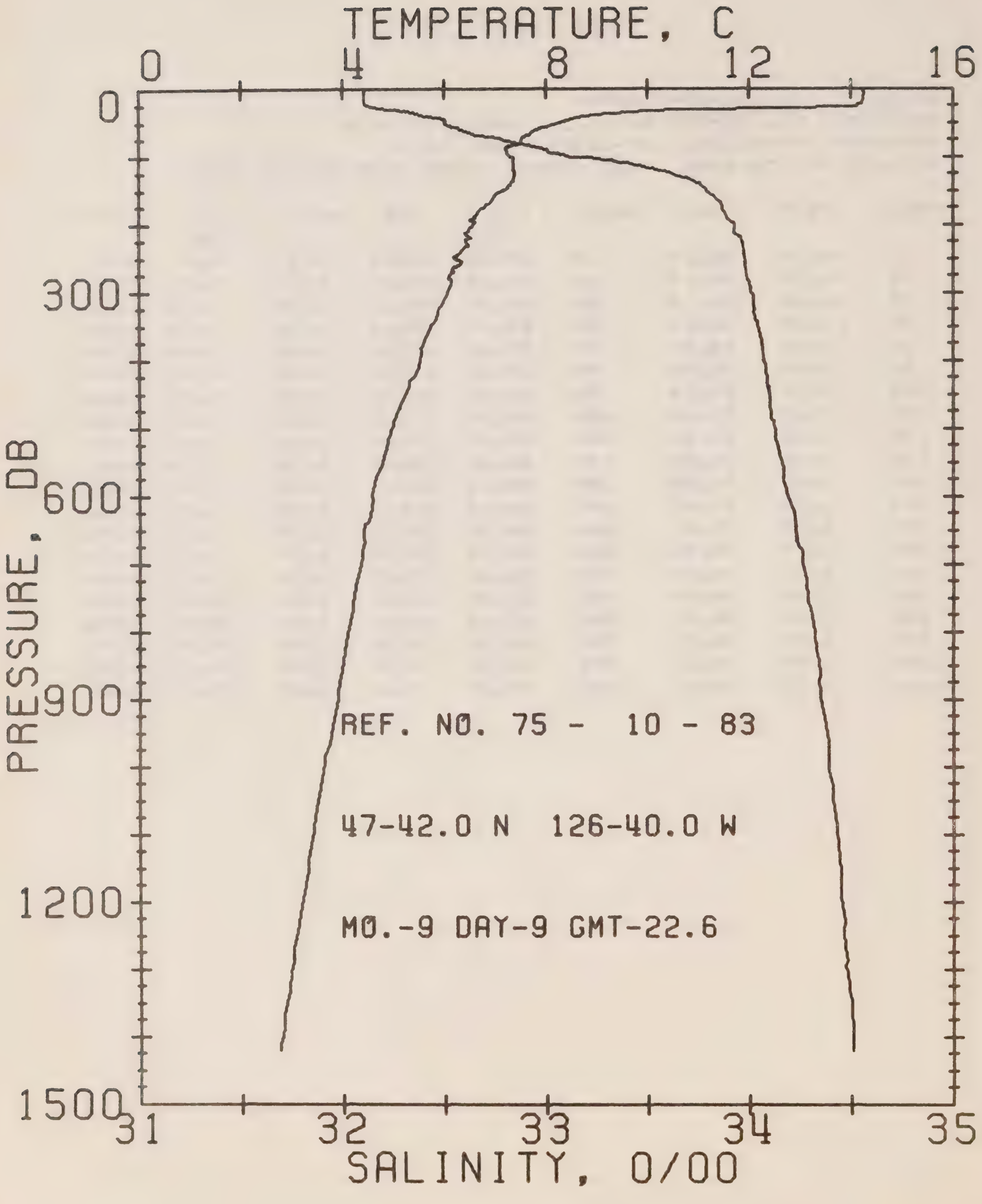
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 82
47-46.0 N 127-40.0 W
MO.-9 DAY-9 GMT-18.6
31
32
33
34
35
SALINITY, O/OO

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 82 DATE 9/ 9/75
POSITION 47-46.0N, 127-40.0W GMT 18.6
RESULTS OF STP CAST 287 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.83	32.17	0	23.85	405.9	0.0	0.0	1503.
10	14.83	32.17	10	23.85	406.5	0.41	0.02	1504.
20	14.84	32.18	20	23.86	406.1	0.81	0.08	1504.
30	14.81	32.21	30	23.89	403.5	1.22	0.19	1504.
50	8.81	32.50	50	25.22	277.1	1.85	0.44	1484.
75	7.47	32.72	75	25.58	242.4	2.50	0.85	1479.
100	7.37	33.28	99	26.04	199.3	3.05	1.34	1480.
125	7.28	33.64	124	26.33	172.1	3.51	1.87	1480.
150	7.34	33.81	149	26.46	160.6	3.93	2.45	1481.
175	7.09	33.90	174	26.56	150.9	4.32	3.09	1481.
200	6.81	33.93	199	26.63	145.3	4.69	3.80	1480.
225	6.55	33.95	224	26.68	140.8	5.05	4.58	1480.
250	6.23	33.95	248	26.72	137.0	5.39	5.42	1479.
300	5.73	33.96	298	26.79	130.6	6.07	7.30	1477.
400	4.97	34.02	397	26.93	118.2	7.31	11.72	1476.
500	4.84	34.13	496	27.03	109.8	8.45	16.95	1477.
600	4.52	34.20	595	27.12	101.2	9.50	22.85	1478.
800	4.01	34.33	793	27.28	87.8	11.39	36.24	1479.
1000	3.53	34.40	991	27.38	78.4	13.04	51.39	1480.
1200	3.10	34.46	1188	27.47	70.4	14.52	67.91	1482.


TEMPERATURE, C
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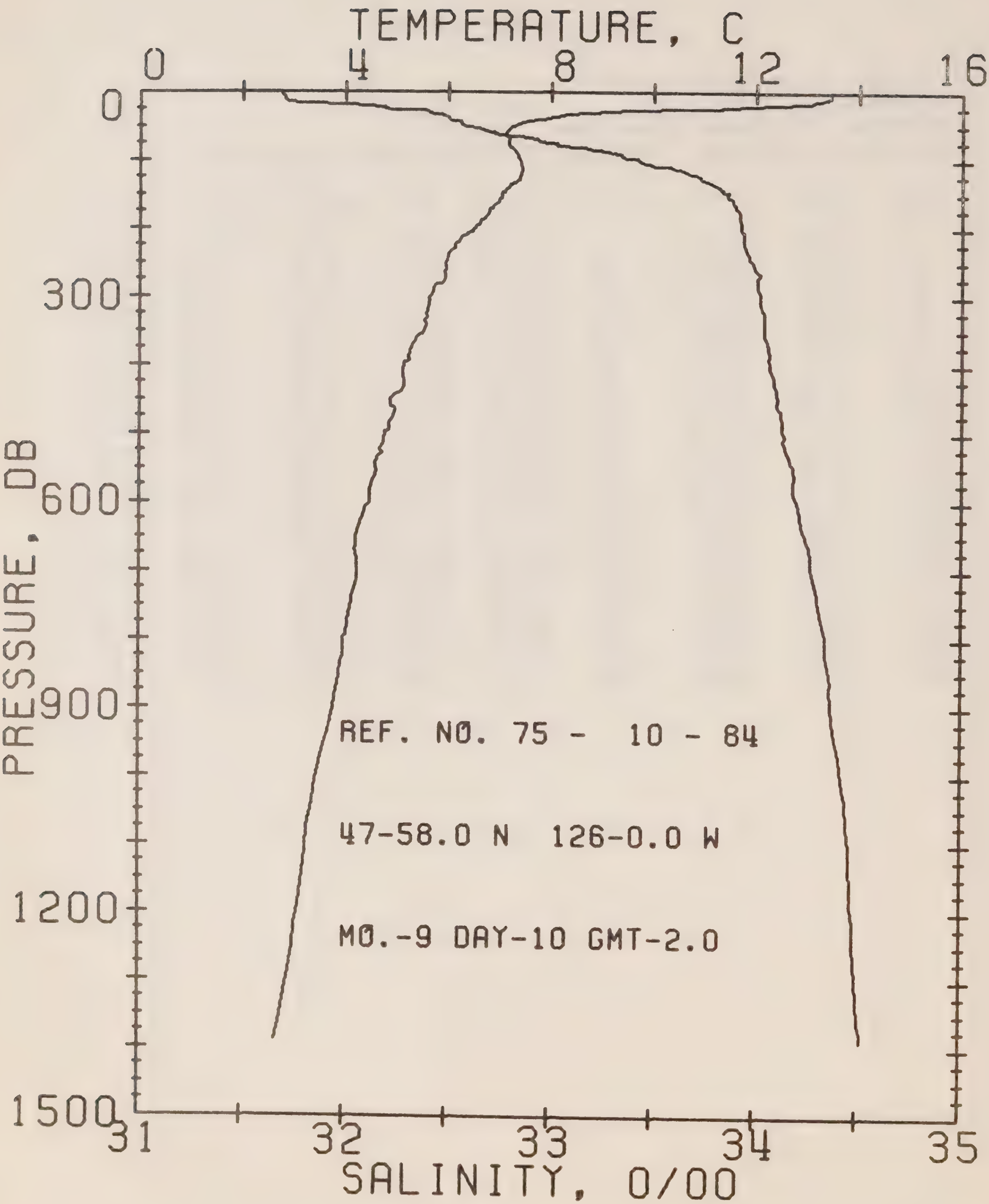
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 83
47-42.0 N 126-40.0 W
MO.-9 DAY-9 GMT-22.6
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 83 DATE 9/ 9/75
POSITION 47-42.0N, 126-40.0W GMT 22.6
RESULTS OF STP CAST 294 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.24	32.11	0	23.93	398.6	0.0	0.0	1501.
10	14.25	32.11	10	23.93	399.1	0.40	0.02	1502.
20	14.20	32.11	20	23.94	398.6	0.80	0.08	1502.
30	10.73	32.25	30	24.71	325.3	1.17	0.18	1490.
50	8.23	32.51	50	25.31	268.0	1.74	0.41	1481.
75	7.50	32.80	75	25.64	236.8	2.38	0.81	1479.
100	7.33	33.17	99	25.96	207.3	2.93	1.30	1480.
125	7.38	33.63	124	26.31	174.2	3.40	1.83	1481.
150	7.16	33.79	149	26.47	159.7	3.81	2.42	1481.
175	6.75	33.87	174	26.59	148.6	4.19	3.05	1479.
200	6.56	33.93	199	26.66	142.0	4.56	3.74	1479.
225	6.43	33.96	224	26.70	138.4	4.91	4.50	1479.
250	6.18	33.96	248	26.73	135.6	5.25	5.33	1478.
300	6.04	34.01	298	26.79	130.7	5.92	7.20	1479.
400	5.52	34.07	397	26.90	120.9	7.17	11.66	1478.
500	4.94	34.13	496	27.02	110.8	8.33	16.97	1478.
600	4.57	34.19	595	27.11	102.8	9.40	22.96	1478.
800	4.09	34.32	793	27.26	89.5	11.32	36.59	1479.
1000	3.61	34.39	991	27.37	80.3	13.01	52.12	1481.
1200	3.19	34.45	1188	27.46	72.0	14.52	69.07	1482.


TEMPERATURE, C
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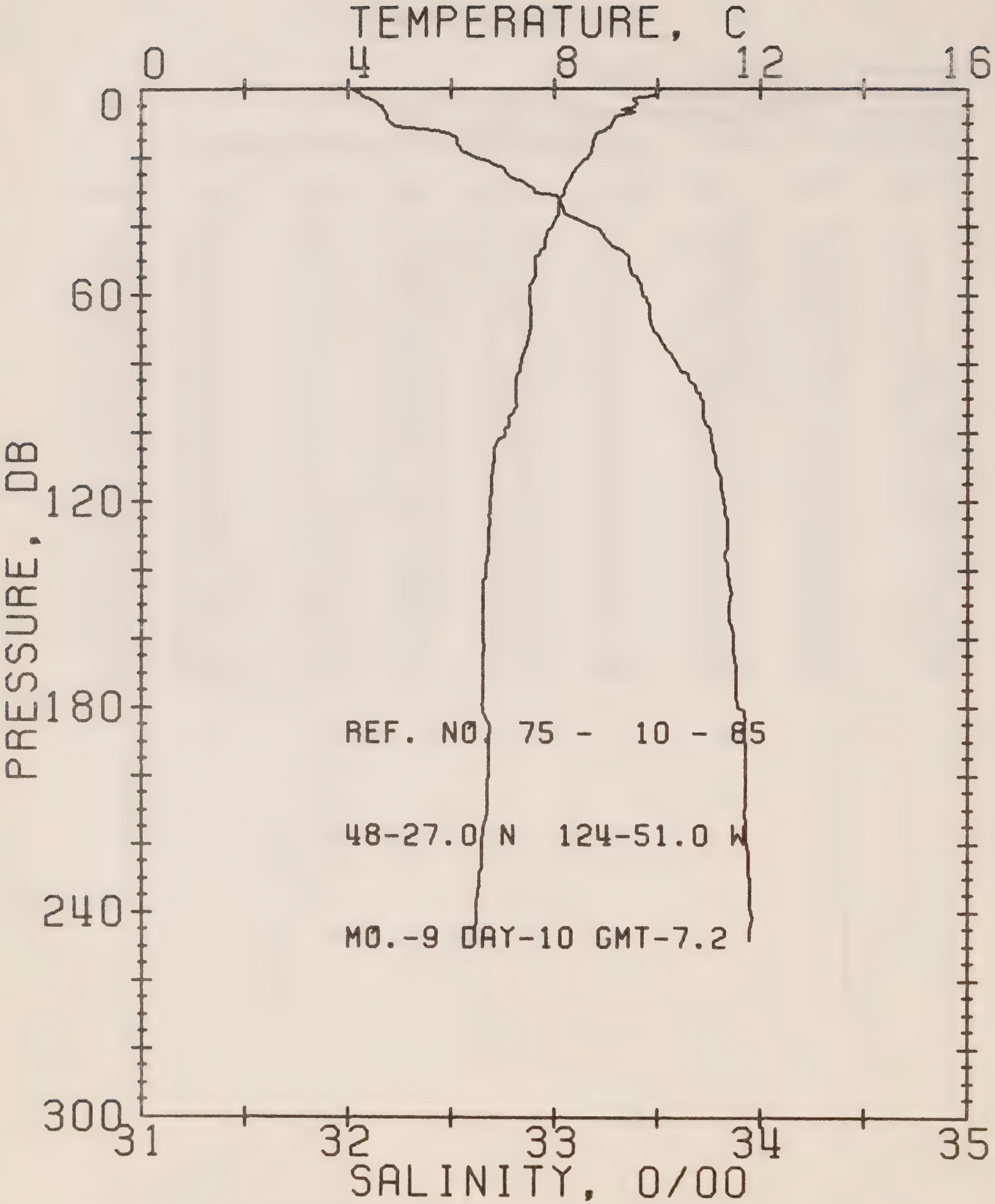
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 75 - 10 - 84
47-58.0 N 126-0.0 W
MO.-9 DAY-10 GMT-2.0
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 84 DATE 10/ 9/75
POSITION 47-58.0N, 126- 0.0W GMT 2.0
RESULTS OF STP CAST 240 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.46	31.69	0	23.77	414.3	0.0	0.0	1498.
10	13.38	31.70	10	23.79	412.5	0.41	0.02	1498.
20	11.92	32.14	20	24.41	353.6	0.81	0.08	1494.
30	8.58	32.41	30	25.18	280.2	1.12	0.16	1482.
50	7.25	32.60	50	25.52	248.1	1.64	0.37	1478.
75	7.17	33.03	75	25.87	215.3	2.22	0.74	1478.
100	7.41	33.44	99	26.16	188.5	2.72	1.18	1480.
125	7.38	33.73	124	26.39	166.7	3.16	1.69	1481.
150	7.04	33.86	149	26.54	152.6	3.56	2.24	1480.
175	6.79	33.92	174	26.62	145.7	3.93	2.86	1480.
200	6.48	33.93	199	26.67	141.0	4.29	3.54	1479.
225	6.13	33.94	223	26.73	135.8	4.64	4.29	1478.
250	5.97	33.98	248	26.78	131.0	4.97	5.10	1478.
300	5.64	34.02	298	26.85	125.1	5.61	6.89	1477.
400	5.14	34.07	397	26.95	116.5	6.82	11.22	1477.
500	4.76	34.13	496	27.04	108.1	7.95	16.37	1477.
600	4.47	34.20	595	27.13	100.8	8.99	22.21	1478.
800	3.98	34.34	793	27.29	86.7	10.85	35.45	1479.
1000	3.46	34.42	991	27.40	76.4	12.50	50.51	1480.
1200	3.08	34.47	1188	27.48	69.3	13.94	66.68	1482.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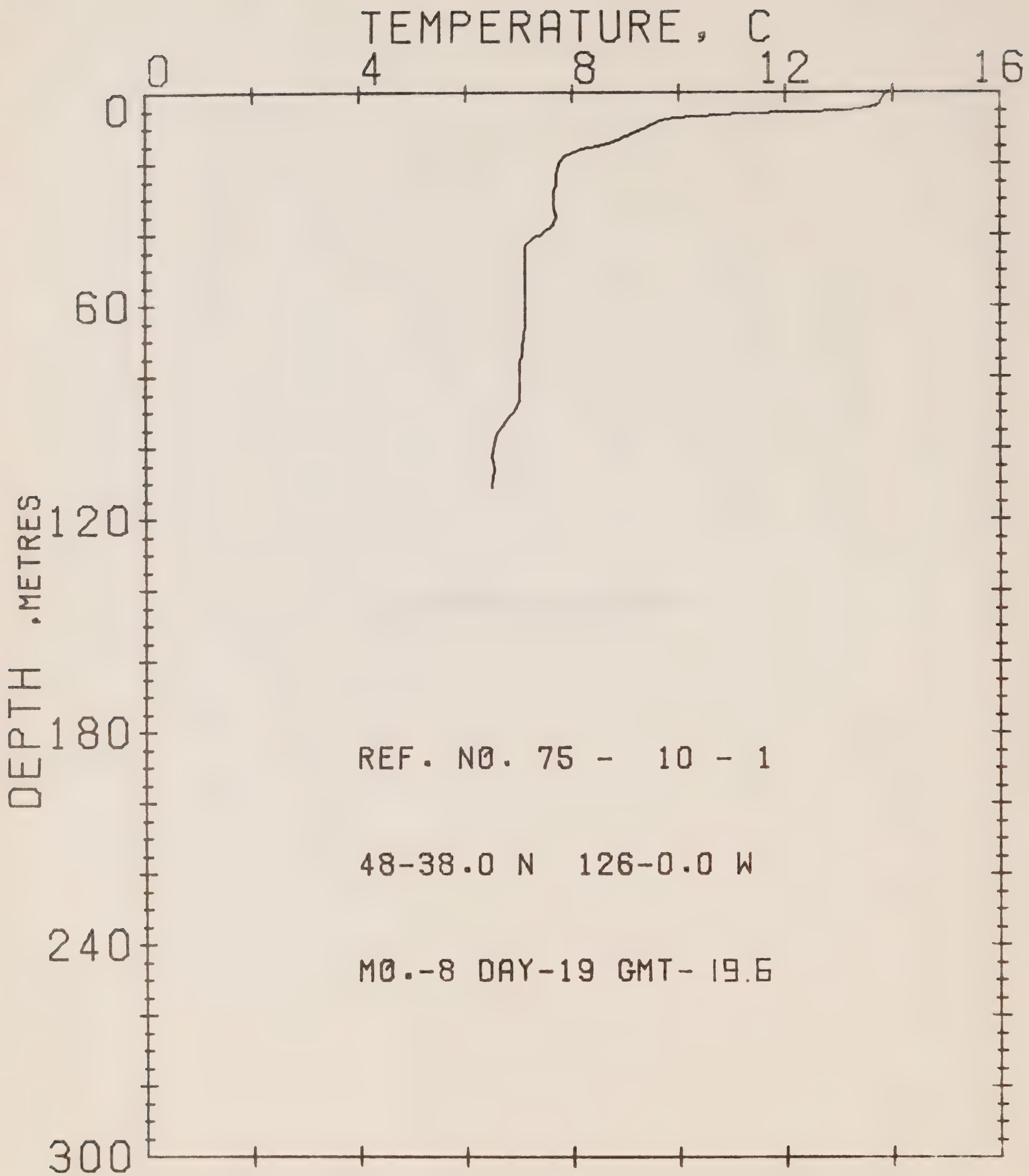
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NO. 75 - 10 - 85
48-27.0 N 124-51.0 W
MO.-9 DAY-10 GMT-7.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 75-10- 85 DATE 10/ 9/75
POSITION 48-27.0N, 124-51.0W GMT 7.2
RESULTS OF STP CAST 159 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.11	32.02	0	24.63	331.6	0.0	0.0	1487.
10	9.12	32.21	10	24.94	302.6	0.31	0.02	1484.
20	8.65	32.62	20	25.33	265.4	0.59	0.06	1483.
30	8.19	32.90	30	25.62	238.2	0.84	0.12	1481.
50	7.62	33.36	50	26.07	196.3	1.27	0.29	1480.
75	7.44	33.53	75	26.23	181.3	1.74	0.60	1480.
100	7.04	33.75	99	26.45	160.3	2.17	0.97	1479.
125	6.74	33.84	124	26.56	150.0	2.55	1.41	1479.
150	6.62	33.85	149	26.59	148.0	2.92	1.93	1478.
175	6.61	33.88	174	26.61	146.0	3.29	2.54	1479.
200	6.70	33.93	199	26.64	143.9	3.65	3.23	1480.
225	6.59	33.94	223	26.66	142.0	4.01	4.01	1480.

RESULTS OF XBT OBSERVATIONS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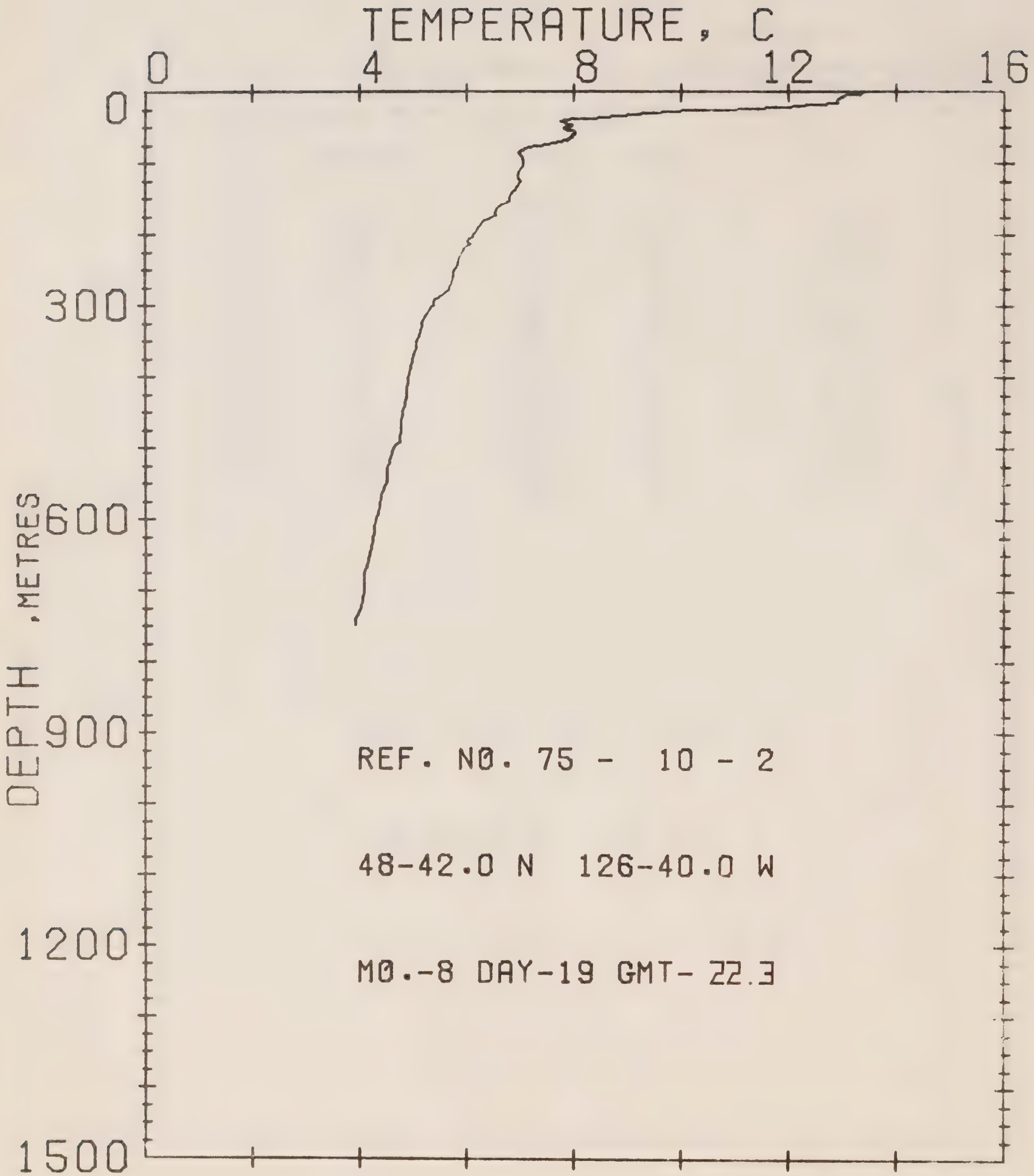
DEPTH ,METRES
REF. NO. 75 - 10 - 1
48-38.0 N 126-0.0 W
MO.-8 DAY-19 GMT- 19.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 1 DATE 19/ 8/75
POSITION 48-38.0N 126- 0.0W GMT 19.6
RESULTS OF XBT CAST 38 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.93	20	7.76	72	7.07
1	13.83	23	7.71	74	7.07
3	13.77	26	7.71	76	7.01
4	13.67	28	7.65	82	7.01
5	13.21	33	7.65	87	7.01
6	11.21	35	7.71	89	6.96
7	9.92	37	7.65	93	6.75
8	9.66	40	7.44	96	6.59
11	9.24	41	7.28	99	6.53
14	8.77	43	7.12	103	6.48
15	8.50	46	7.12	106	6.53
16	8.19	52	7.12	111	6.48
18	7.87	65	7.12		


TEMPERATURE, C
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900
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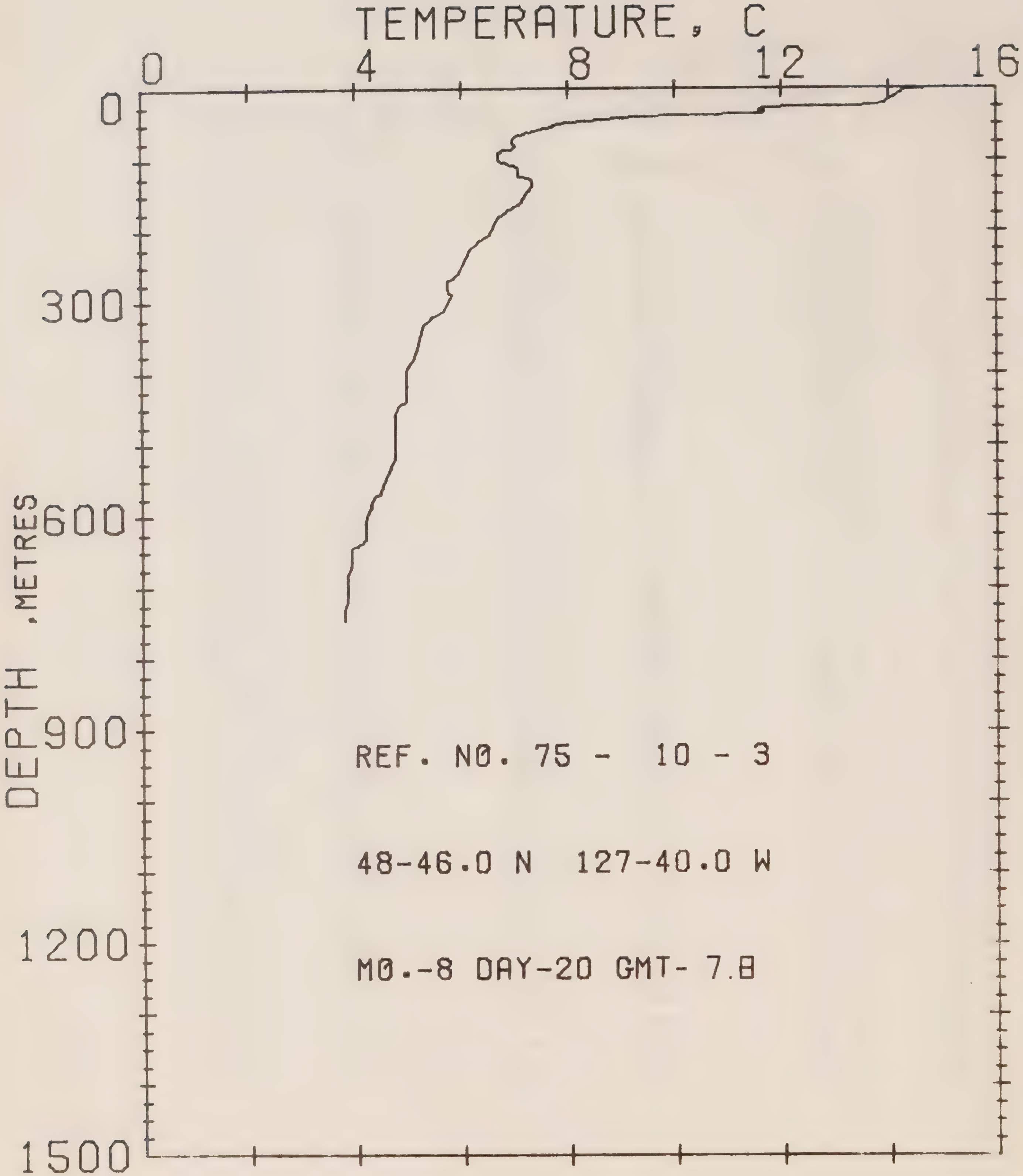
DEPTH ,METRES
REF. NO. 75 - 10 - 2
48-42.0 N 126-40.0 W
MO.-8 DAY-19 GMT- 22.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 2 DATE 19/ 8/75
POSITION 48-42.0N 126-40.0W GMT 22.3
RESULTS OF XBT CAST 113 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.42	59	8.03	233	5.88
3	13.37	61	7.97	243	5.83
4	13.32	63	7.97	252	5.77
5	13.11	65	7.97	260	5.77
7	13.01	66	7.92	268	5.72
10	12.96	68	7.87	278	5.67
12	12.91	70	7.76	287	5.50
16	12.91	73	7.65	295	5.39
17	12.80	74	7.55	301	5.39
18	12.70	76	7.34	303	5.34
19	12.45	79	7.18	307	5.34
20	12.19	81	7.07	316	5.23
21	11.98	84	7.01	325	5.18
22	11.73	87	6.96	330	5.13
23	11.42	90	7.01	344	5.12
25	10.70	96	7.07	349	5.07
26	10.59	99	7.07	360	5.07
27	10.23	105	7.07	368	5.01
29	9.81	114	6.96	389	4.96
30	9.50	122	6.96	403	4.90
31	9.34	127	7.01	441	4.85
32	9.19	131	6.96	447	4.79
34	8.82	137	6.91	492	4.74
35	8.55	142	6.85	501	4.63
37	8.34	148	6.80	521	4.57
38	8.03	154	6.80	529	4.52
40	7.87	156	6.75	548	4.52
41	7.76	159	6.64	569	4.41
43	7.76	162	6.59	594	4.35
46	7.87	168	6.53	601	4.30
47	7.97	174	6.53	629	4.24
48	7.97	178	6.42	668	4.13
50	7.92	182	6.32	673	4.07
51	7.81	192	6.21	699	4.07
52	7.81	204	6.10	723	4.02
54	7.87	209	5.99	741	3.91
55	7.97	214	6.05	747	3.91
56	8.03	223	5.94		



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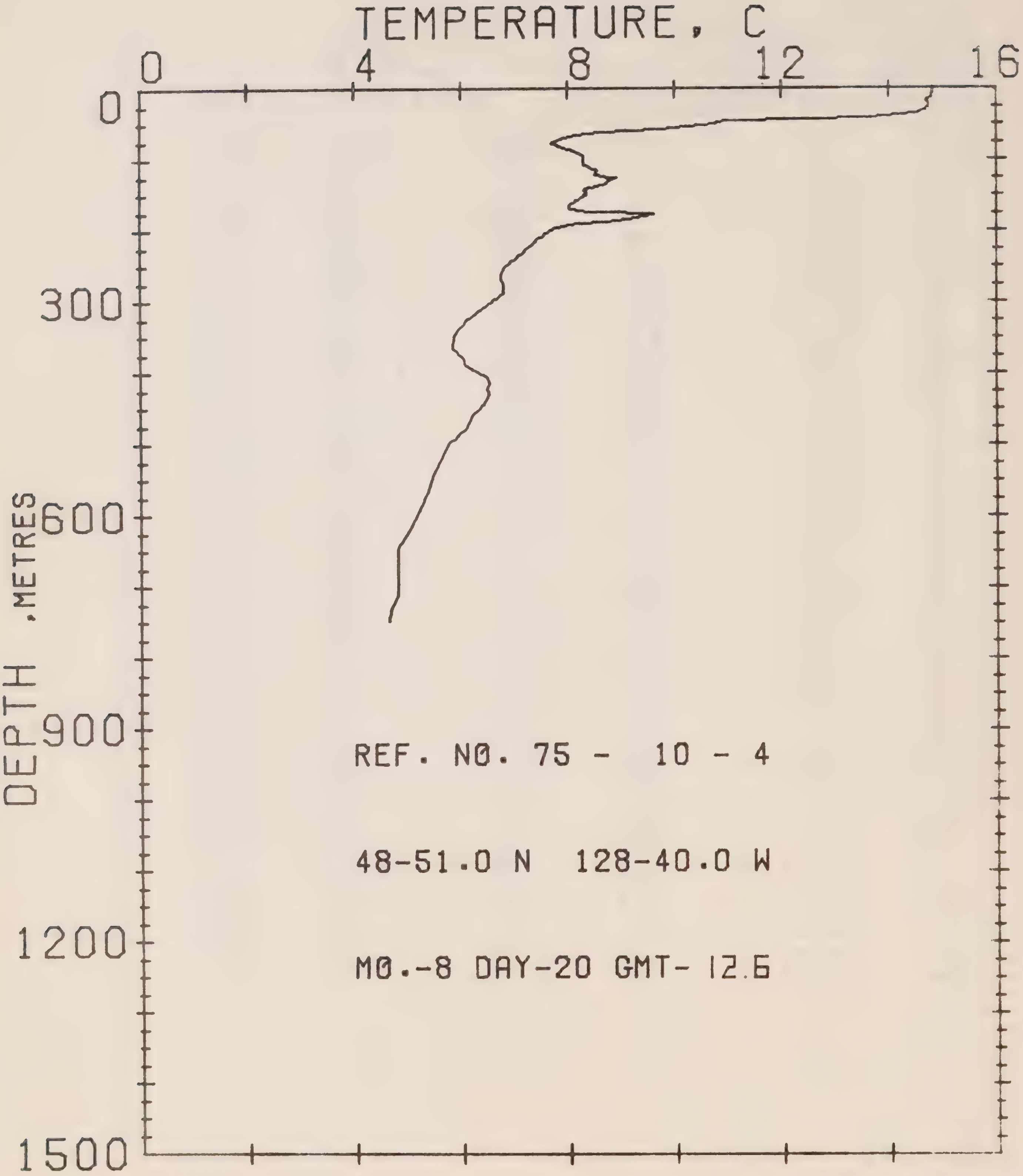
REF. NO. 75 - 10 - 3
48-46.0 N 127-40.0 W
MO.-8 DAY-20 GMT- 7.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 3 DATE 20/ 8/75
POSITION 48-46.0N 127-40.0W GMT 7.8
RESULTS OF XBT CAST 101 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.64	91	6.69	335	5.28
2	14.33	96	6.69	366	5.18
6	14.23	99	6.69	378	5.12
14	14.08	102	6.69	391	5.01
19	13.98	107	6.85	397	4.96
22	13.93	110	7.01	422	4.96
24	13.77	113	7.07	437	4.96
25	13.26	120	7.07	448	4.79
26	12.86	124	7.07	458	4.74
27	12.19	126	7.23	480	4.74
28	11.83	129	7.34	517	4.74
29	11.68	132	7.34	532	4.68
30	11.62	138	7.34	547	4.57
32	11.57	144	7.28	568	4.46
33	11.62	149	7.23	574	4.35
34	11.68	153	7.18	583	4.30
35	11.62	159	7.12	588	4.30
38	10.18	164	7.07	593	4.24
40	9.29	167	6.96	609	4.18
44	8.66	173	6.85	612	4.18
49	8.03	182	6.69	631	4.18
50	7.81	190	6.64	636	4.13
54	7.71	206	6.53	641	4.02
58	7.50	216	6.32	644	3.91
63	7.18	228	6.15	663	3.91
67	7.01	243	6.05	671	3.91
71	6.96	260	5.94	681	3.85
76	6.96	269	5.83	693	3.85
78	6.96	273	5.72	705	3.85
80	7.01	282	5.72	713	3.85
83	7.01	287	5.77	720	3.85
85	6.96	290	5.83	731	3.80
87	6.80	313	5.67	746	3.80
90	6.75	321	5.45		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900
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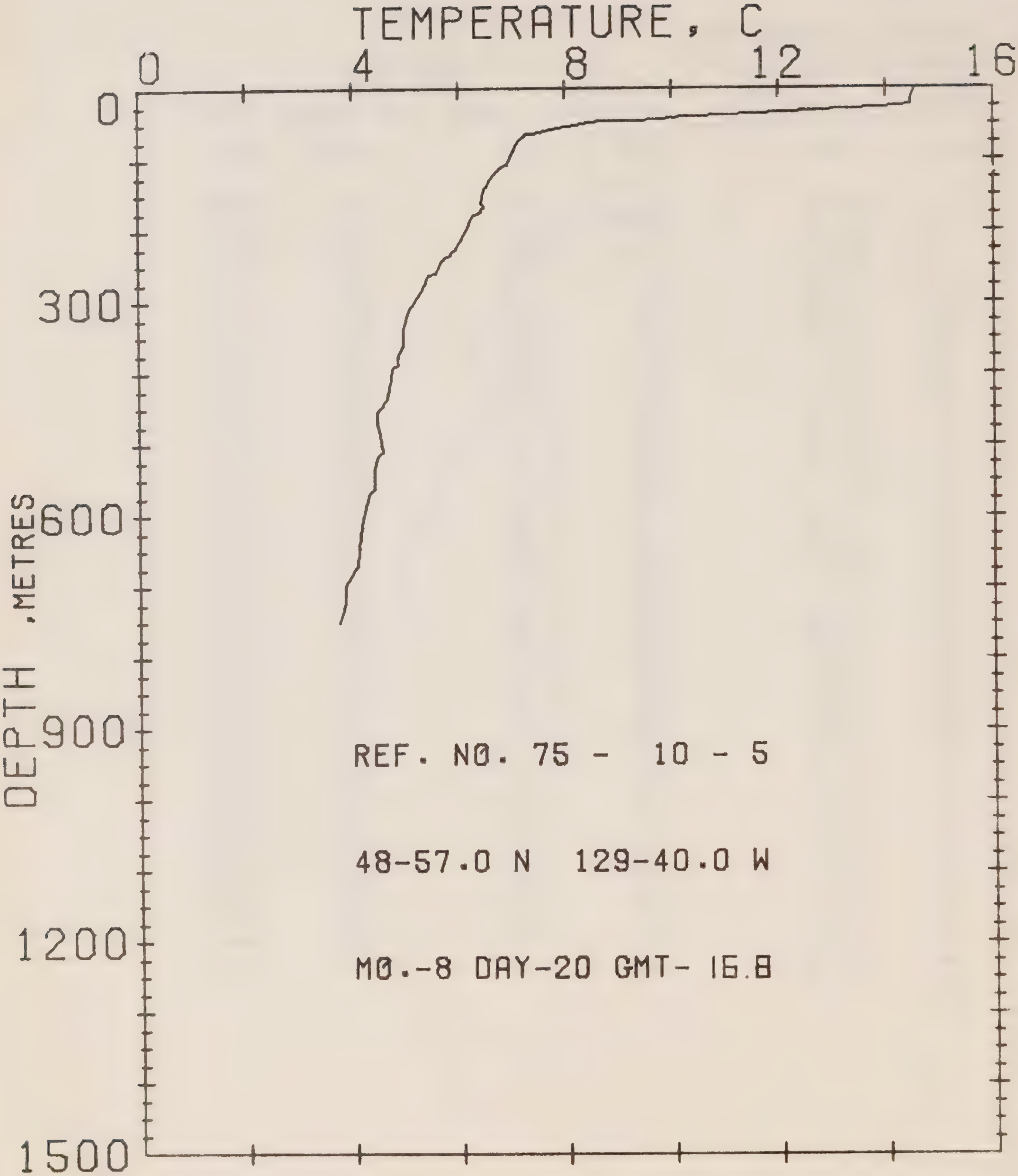
DEPTH ,METRES
REF. NO. 75 - 10 - 4
48-51.0 N 128-40.0 W
MO.-8 DAY-20 GMT- 12.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 4 DATE 20/ 8/75
POSITION 48-51.0N 128-40.0W GMT 12.6
RESULTS OF XBT CAST 100 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	14.84	103	8.29	246	6.91
6	14.84	108	8.29	253	6.80
7	14.84	112	8.40	261	6.75
9	14.79	116	8.55	269	6.75
11	14.79	122	8.50	279	6.80
13	14.79	124	8.61	288	6.80
15	14.74	126	8.71	301	6.59
16	14.74	127	8.92	325	6.10
18	14.69	130	8.77	348	5.88
20	14.69	134	8.71	366	5.83
22	14.74	137	8.55	374	5.94
24	14.74	142	8.34	381	6.05
26	14.74	144	8.29	389	6.05
27	14.74	146	8.34	396	6.21
29	14.74	150	8.34	406	6.48
31	14.69	152	8.29	415	6.53
32	14.69	159	8.13	423	6.48
33	14.64	165	8.03	430	6.53
34	14.59	169	8.03	445	6.42
35	14.54	170	8.03	460	6.21
36	14.49	173	8.34	475	6.10
41	13.62	174	8.87	488	5.94
44	12.45	175	9.29	499	5.77
47	10.95	176	9.55	512	5.67
51	10.75	178	9.60	540	5.50
57	9.71	183	9.29	565	5.39
62	8.61	187	8.71	592	5.23
66	8.13	190	8.19	622	5.01
71	7.87	193	7.92	646	4.79
75	7.76	198	7.71	678	4.79
78	7.71	207	7.55	713	4.79
82	7.81	217	7.39	733	4.68
88	8.08	230	7.18	747	4.63
96	8.29				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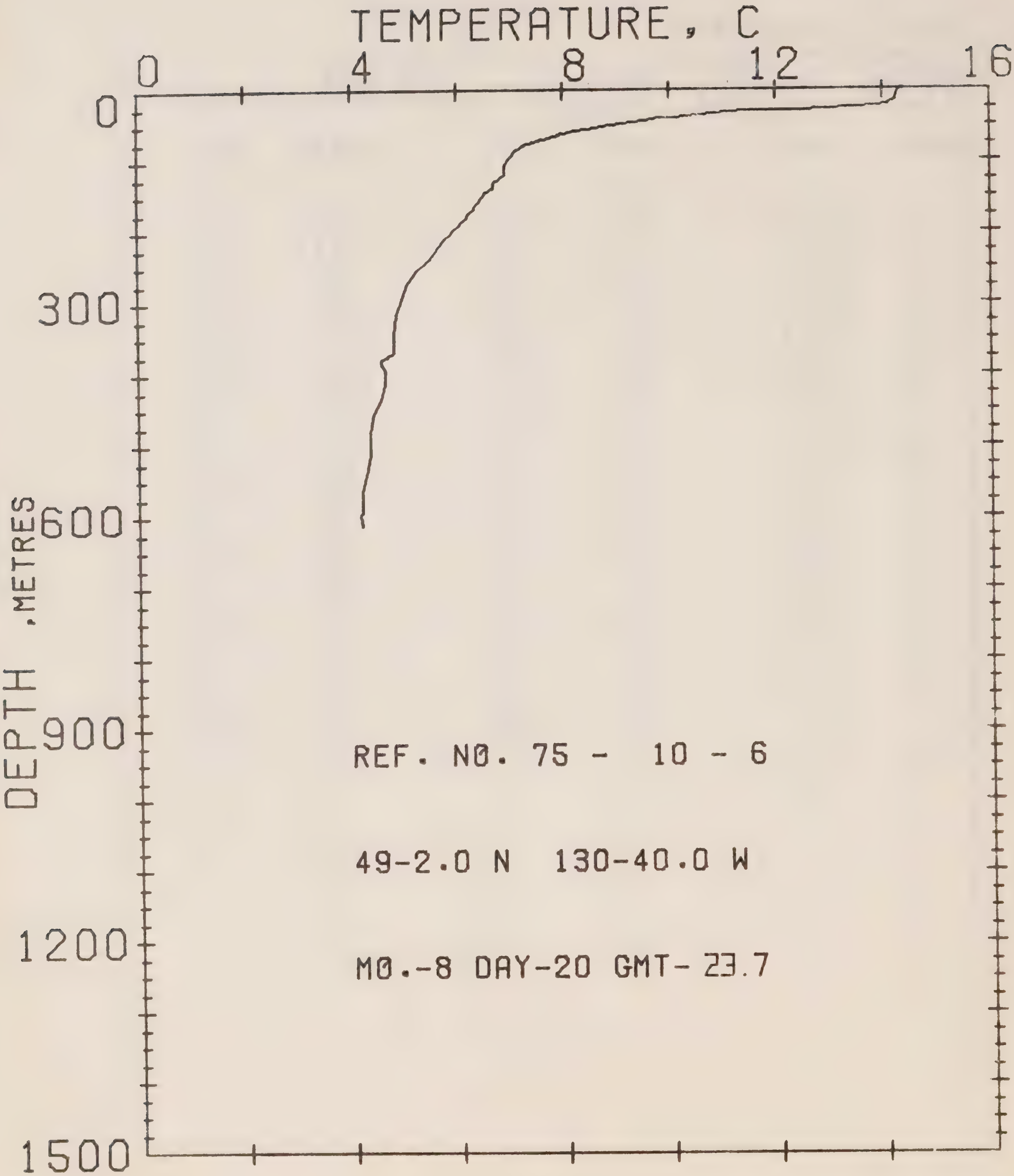
DEPTH ,METRES
REF. NO. 75 - 10 - 5
48-57.0 N 129-40.0 W
MO.-8 DAY-20 GMT- 16.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 5 DATE 20/ 8/75
POSITION 48-57.0N 129-40.0W GMT 16.8
RESULTS OF XBT CAST 73 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	14.59	108	6.91	311	5.07
3	14.54	112	6.80	337	4.90
11	14.49	115	6.75	361	4.96
19	14.44	121	6.69	376	4.85
22	14.44	129	6.59	388	4.85
24	14.44	138	6.53	393	4.74
26	14.23	142	6.48	434	4.66
29	13.88	163	6.42	446	4.57
33	12.65	166	6.48	454	4.46
37	10.95	167	6.48	470	4.40
39	10.49	170	6.42	485	4.52
40	10.23	172	6.42	510	4.57
44	9.76	174	6.42	518	4.46
46	9.34	177	6.37	536	4.41
47	8.71	180	6.26	561	4.41
49	8.45	189	6.21	571	4.30
52	8.24	206	6.10	589	4.24
55	8.03	226	5.94	603	4.10
57	7.76	233	5.83	625	4.13
63	7.44	240	5.72	671	4.07
65	7.28	244	5.67	698	3.85
69	7.23	259	5.56	722	3.85
75	7.12	263	5.45	739	3.80
86	7.07	282	5.34	749	3.74
99	6.96				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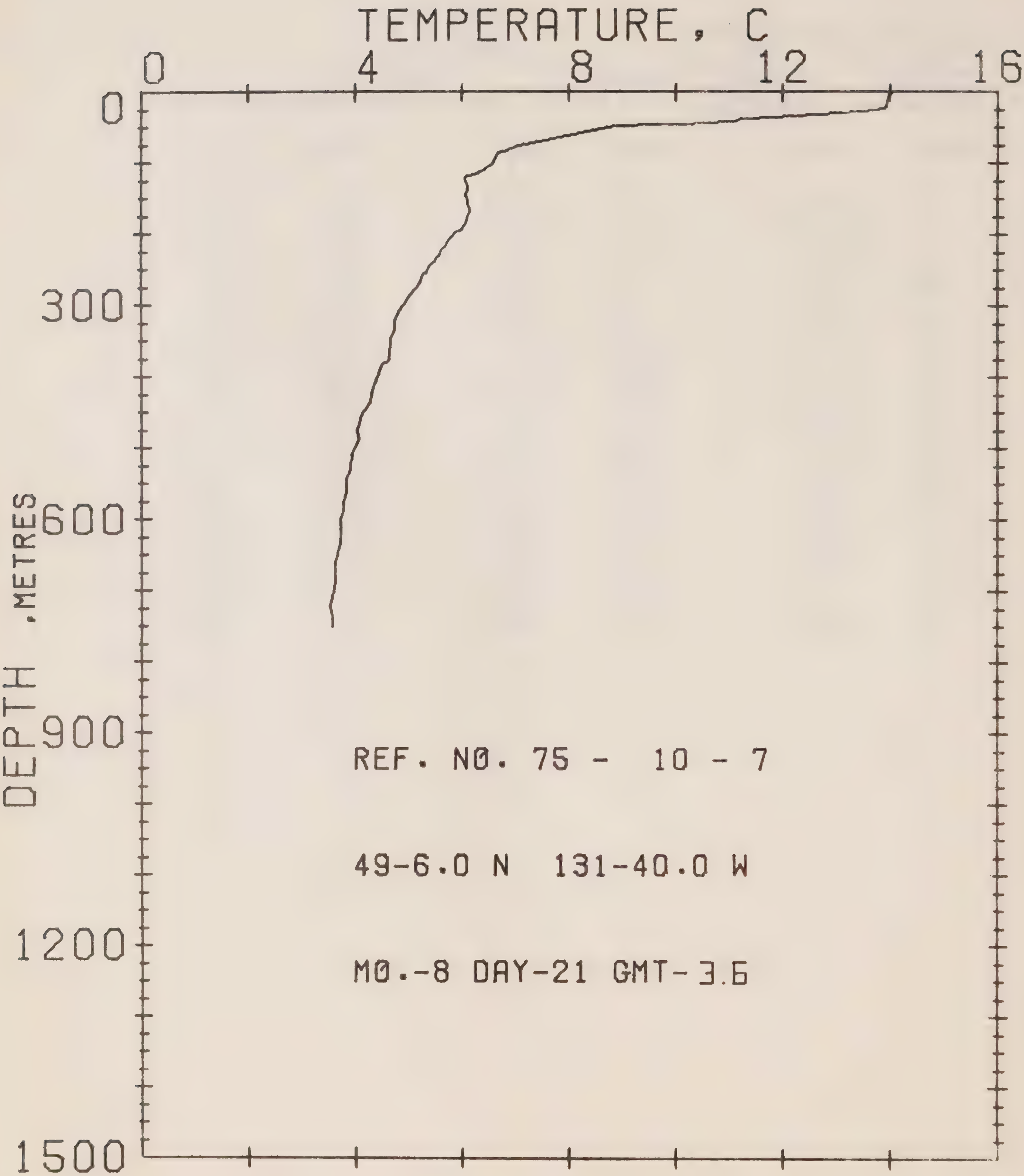
900
1200
1500
DEPTH .METRES
REF. NO. 75 - 10 - 6
49-2.0 N 130-40.0 W
MO.-8 DAY-20 GMT- 23.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 6   DATE 20/ 8/75
POSITION 49- 2.0N 130-40.0W   GMT 23.7
RESULTS OF XBT CAST   57 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	14.38	58	8.24	345	4.79
1	14.33	63	7.92	369	4.79
7	14.28	67	7.76	376	4.68
15	14.23	71	7.55	380	4.57
19	14.18	77	7.28	386	4.57
22	14.08	86	7.12	395	4.63
23	13.93	107	6.91	411	4.63
25	13.42	121	6.91	436	4.57
28	12.91	133	6.69	449	4.46
30	12.45	137	6.69	459	4.41
31	11.42	145	6.53	482	4.35
34	10.80	169	6.32	513	4.35
39	10.07	191	6.05	531	4.30
40	9.81	213	5.77	549	4.24
45	9.55	237	5.50	565	4.18
47	9.34	255	5.23	587	4.16
48	9.13	273	5.07	593	4.18
50	8.87	294	4.96	598	4.13
53	8.61	317	4.85	611	4.16


TEMPERATURE, C
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DEPTH ,METRES
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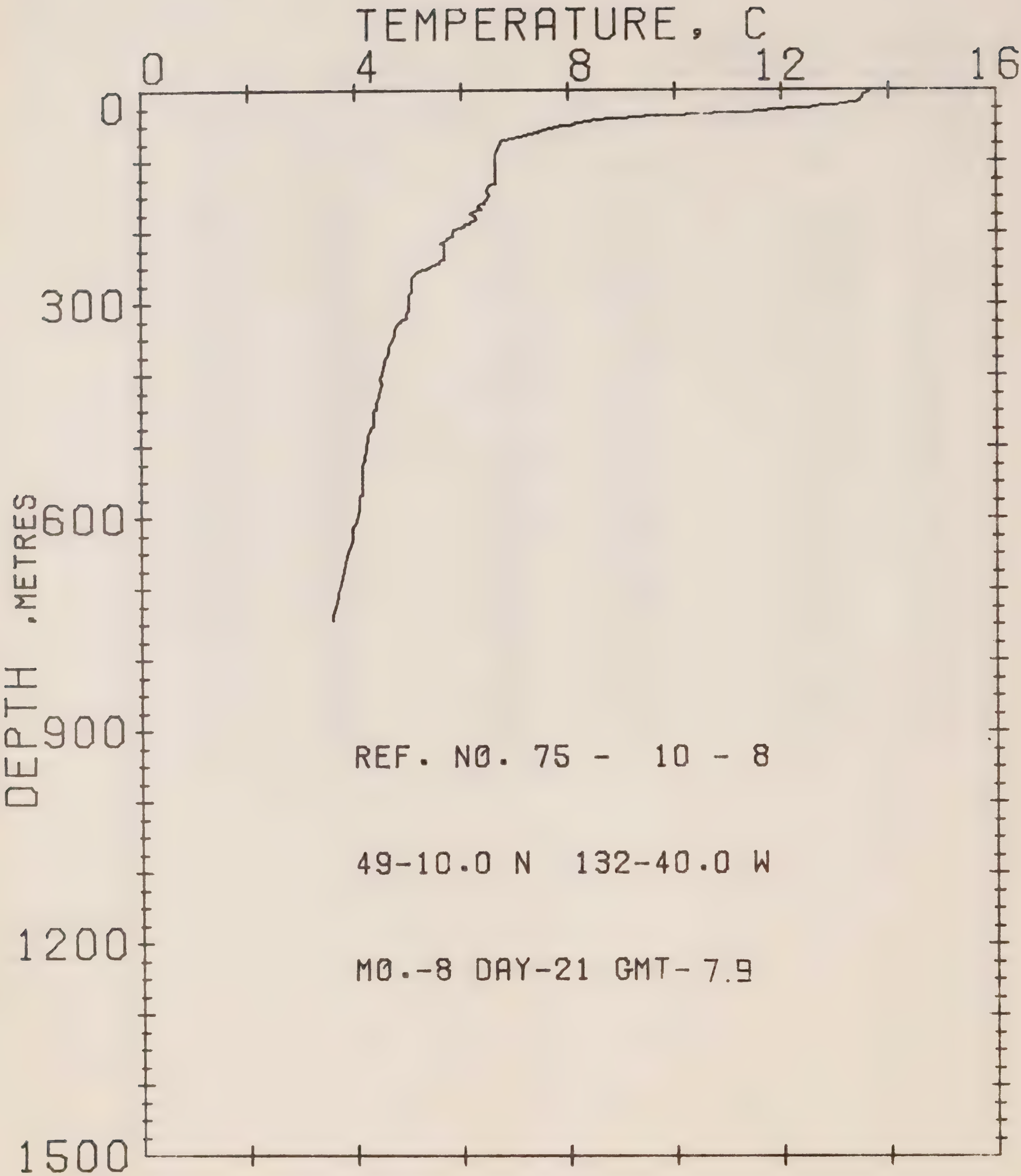
1500
REF. NO. 75 - 10 - 7
49-6.0 N 131-40.0 W
MO.-8 DAY-21 GMT- 3.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 7 DATE 21/ 8/75
POSITION 49- 6.0N 131-40.0W GMT 3.6
RESULTS OF XBT CAST 69 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	14.03	140	6.10	406	4.41
6	13.98	147	6.05	414	4.35
21	13.93	152	6.10	435	4.30
24	13.88	158	6.10	454	4.13
26	13.77	167	6.15	467	4.07
31	13.06	178	6.10	476	4.02
37	11.32	193	5.99	488	4.07
38	11.21	197	5.94	509	3.96
41	11.11	199	5.88	529	3.91
42	11.01	226	5.61	544	3.85
46	10.13	230	5.56	563	3.85
47	9.71	247	5.39	576	3.80
48	8.87	253	5.34	588	3.80
66	7.71	255	5.28	600	3.74
76	7.07	269	5.23	612	3.74
82	6.85	289	5.01	632	3.74
87	6.69	305	4.85	650	3.66
100	6.59	320	4.74	661	3.63
109	6.42	333	4.74	688	3.63
117	6.15	346	4.68	710	3.57
121	6.05	376	4.63	722	3.52
125	6.05	384	4.52	740	3.57
132	6.10	397	4.46	749	3.57


TEMPERATURE, C
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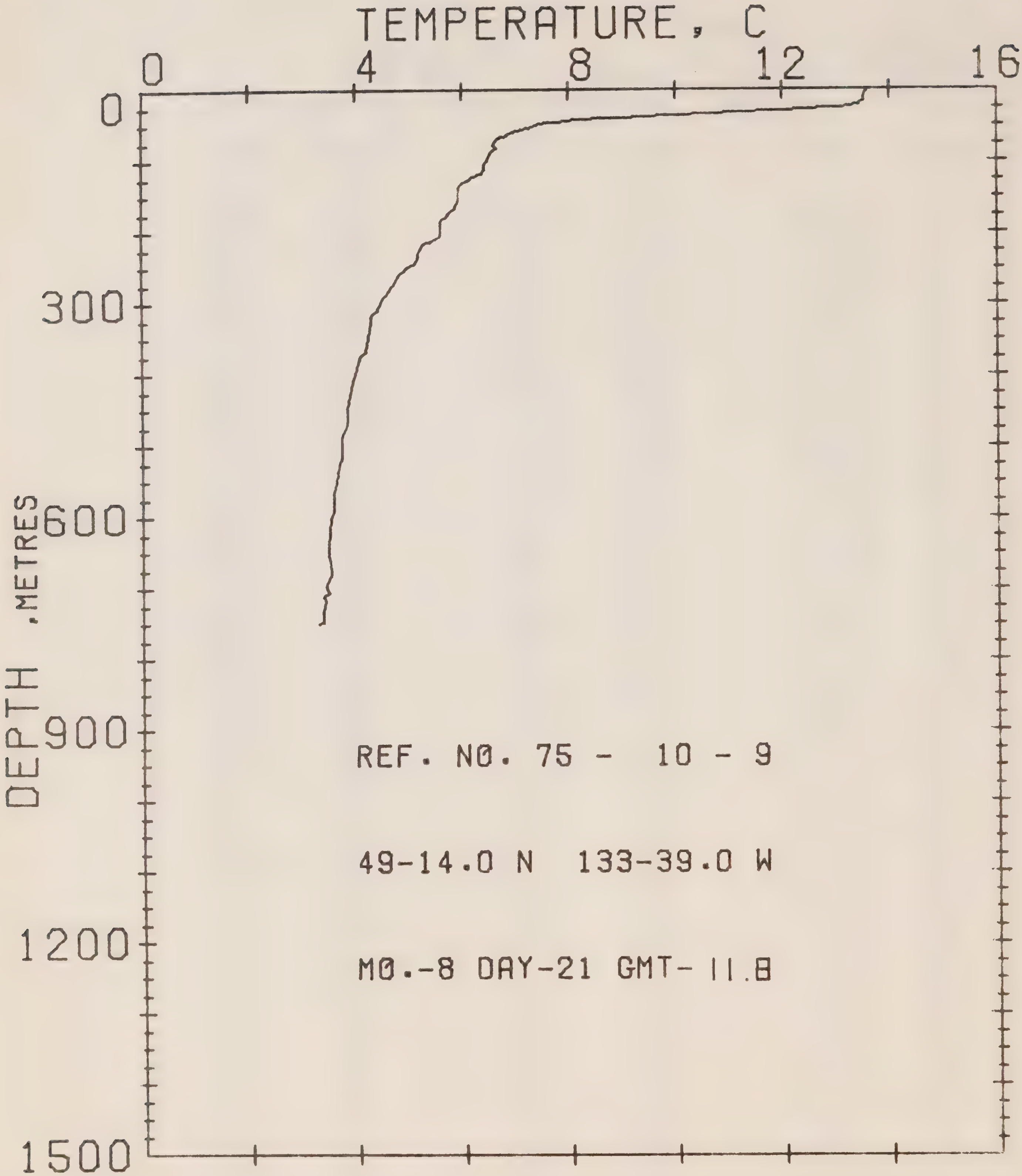
DEPTH .METRES
REF. NO. 75 - 10 - 8
49-10.0 N 132-40.0 W
MO.-8 DAY-21 GMT- 7.9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 8   DATE 21/ 8/75
POSITION 49-10.0N 132-40.0W   GMT 7.9
RESULTS OF XBT CAST   129 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	13.62	107	6.64	264	5.07
3	13.62	122	6.64	276	5.07
4	13.62	131	6.64	283	5.07
7	13.52	135	6.53	289	5.01
11	13.52	139	6.48	294	5.01
14	13.47	144	6.48	306	5.01
17	13.47	149	6.53	310	5.01
18	13.42	153	6.48	315	4.96
19	13.32	154	6.48	320	4.96
20	13.16	158	6.42	325	4.85
21	13.01	159	6.42	330	4.79
22	12.80	163	6.32	336	4.74
24	12.65	166	6.32	345	4.74
25	12.50	167	6.37	359	4.63
27	12.34	169	6.37	368	4.63
29	11.88	171	6.26	382	4.57
31	11.62	173	6.15	400	4.52
32	11.32	175	6.21	406	4.46
33	10.95	179	6.26	413	4.52
34	10.54	183	6.26	430	4.46
35	9.86	187	6.15	439	4.41
36	9.66	188	6.10	447	4.41
37	9.29	189	6.05	450	4.35
39	8.98	192	6.05	453	4.35
40	8.82	193	5.99	472	4.35
42	8.55	197	5.88	477	4.30
44	8.40	201	5.83	485	4.24
46	8.19	205	5.83	518	4.16
48	8.13	208	5.77	527	4.13
50	8.08	210	5.72	546	4.13
51	7.87	215	5.61	567	4.13
53	7.71	217	5.67	571	4.07
56	7.55	227	5.67	588	4.07
60	7.44	234	5.67	607	4.02
62	7.34	237	5.67	615	3.96
64	7.23	241	5.61	633	3.96
68	6.96	244	5.56	654	3.85
71	6.75	246	5.50	694	3.74
75	6.75	250	5.39	706	3.68
83	6.69	252	5.34	713	3.66
90	6.64	254	5.23	727	3.63
99	6.64	256	5.18	739	3.57
102	6.64	260	5.12	745	3.57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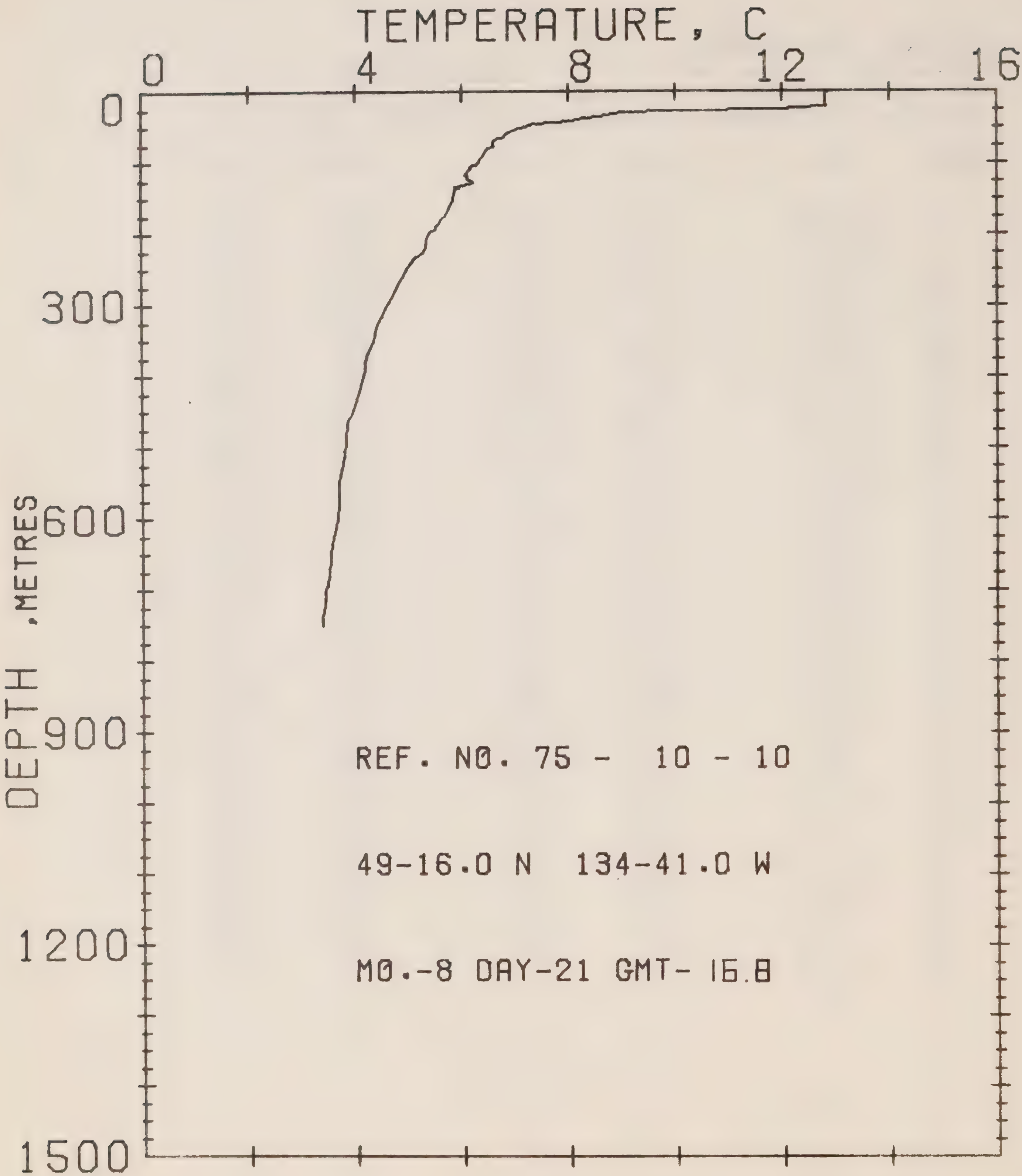
49-14.0 N 133-39.0 W
MO.-8 DAY-21 GMT- 11.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 9 DATE 21/ 8/75
POSITION 49-14.0N 133-39.0W GMT 11.8
RESULTS OF XBT CAST 97 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	13.57	90	6.53	318	4.30
5	13.57	99	6.48	325	4.30
10	13.52	105	6.42	348	4.24
14	13.52	112	6.42	369	4.18
17	13.52	117	6.37	375	4.07
22	13.42	121	6.26	379	4.07
24	13.26	127	6.15	410	3.96
26	13.06	133	5.99	447	3.85
27	12.80	136	5.94	471	3.85
28	12.50	148	5.94	485	3.74
29	12.34	154	5.94	509	3.74
30	12.09	165	5.88	518	3.74
31	11.78	174	5.77	526	3.68
32	11.26	177	5.72	551	3.65
33	11.06	184	5.61	569	3.57
34	10.75	196	5.61	592	3.57
36	9.81	203	5.61	599	3.52
38	9.50	207	5.56	641	3.46
39	8.87	210	5.50	649	3.46
40	8.61	214	5.39	652	3.46
41	8.29	216	5.28	675	3.52
43	8.15	222	5.23	683	3.52
46	7.81	231	5.18	688	3.46
47	7.60	236	5.18	698	3.41
50	7.39	243	5.12	705	3.46
53	7.28	249	4.96	711	3.35
56	7.12	254	4.90	717	3.41
60	6.96	261	4.79	733	3.35
64	6.85	270	4.74	739	3.35
69	6.69	282	4.63	742	3.35
73	6.64	294	4.52	747	3.35
78	6.59	309	4.41	749	3.29
82	6.64				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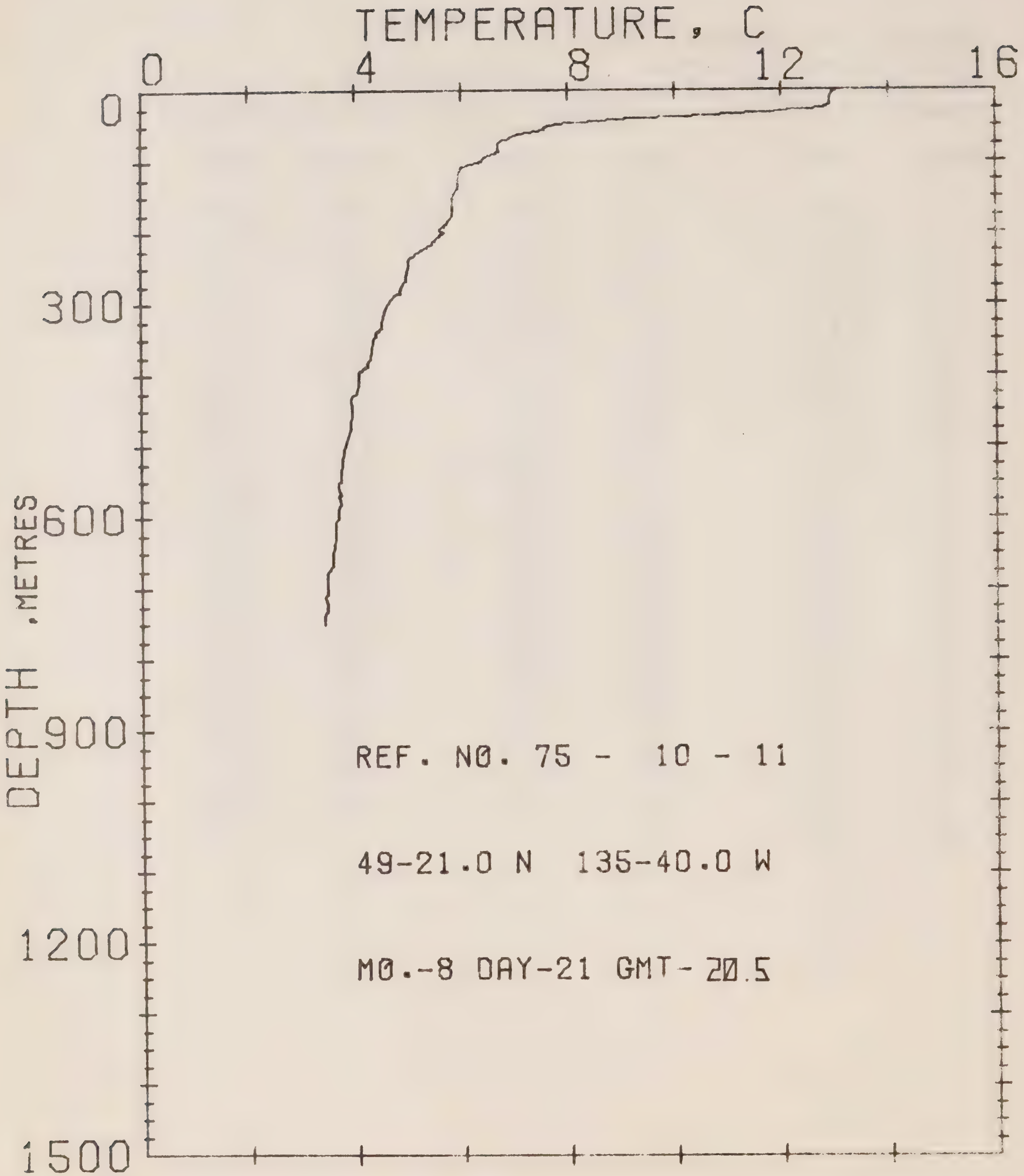
DEPTH ,METRES
REF. NO. 75 - 10 - 10
49-16.0 N 134-41.0 W
MO.-8 DAY-21 GMT- 16.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 10 DATE 21/ 8/75
POSITION 49-16.0N 134-41.0W GMT 16.8
RESULTS OF XBT CAST 82 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.86	103	6.26	307	4.57
5	12.80	106	6.15	316	4.52
16	12.80	109	6.15	322	4.46
21	12.80	114	6.10	330	4.41
22	12.70	117	6.05	352	4.35
24	12.34	119	6.10	367	4.24
25	11.93	123	6.10	380	4.18
27	11.37	128	6.21	386	4.18
28	10.59	130	6.15	392	4.18
29	9.71	132	6.05	421	4.07
30	9.24	135	5.88	452	3.96
31	9.03	136	5.94	464	3.85
32	8.82	137	5.88	512	3.80
35	8.61	155	5.83	551	3.68
38	8.29	176	5.67	562	3.68
41	8.08	183	5.61	582	3.68
45	7.71	193	5.50	611	3.63
47	7.39	200	5.39	625	3.57
48	7.28	208	5.34	647	3.52
54	7.01	219	5.34	659	3.52
61	6.85	225	5.28	695	3.46
64	6.80	233	5.12	700	3.41
67	6.64	241	5.07	720	3.41
71	6.59	250	4.96	740	3.35
76	6.59	260	4.90	745	3.35
79	6.59	265	4.85	748	3.35
83	6.48	296	4.63	749	3.35
100	6.32				


TEMPERATURE, C
0
4
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12
16
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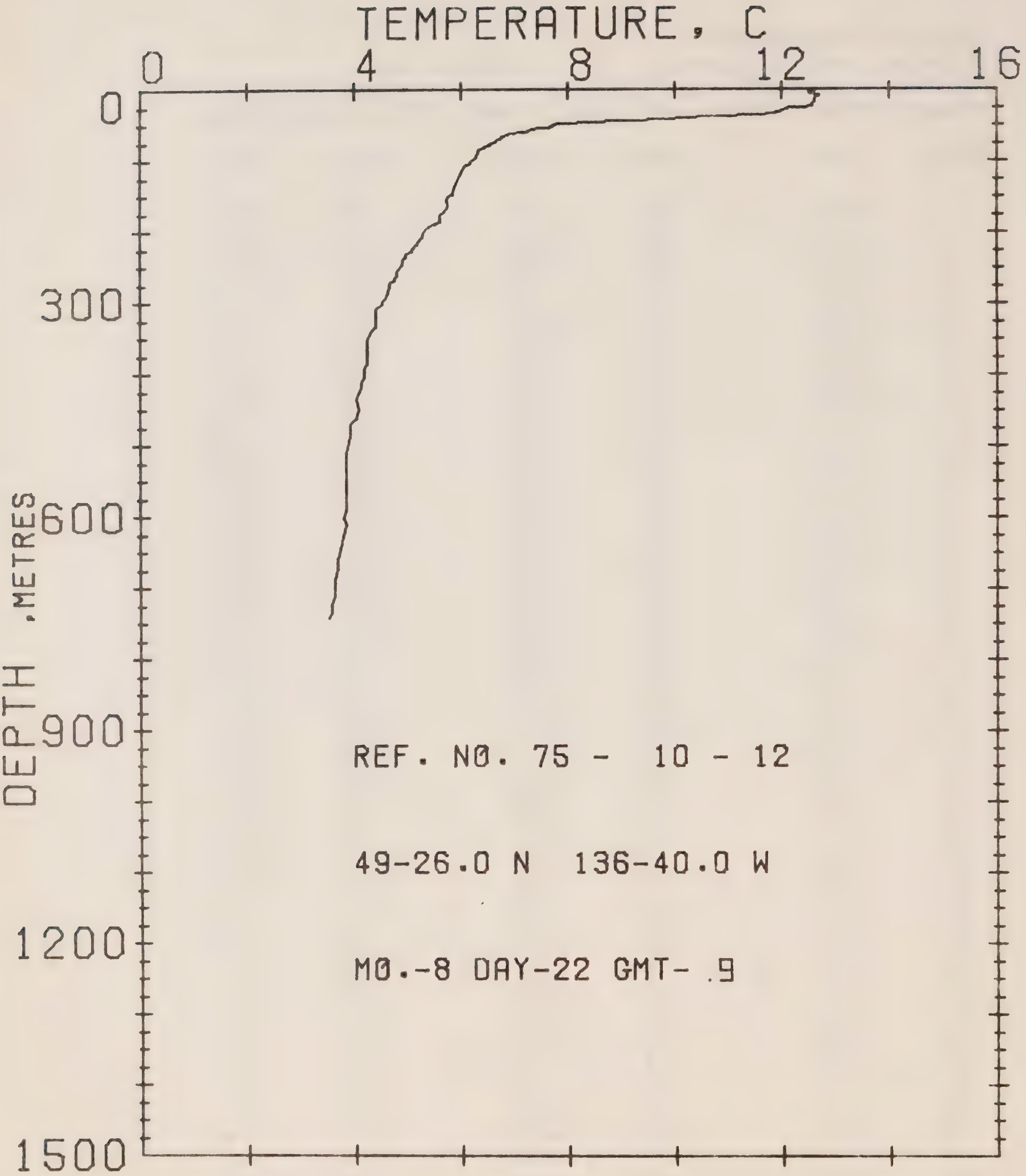
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 11
49-21.0 N 135-40.0 W
MO.-8 DAY-21 GMT-20.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 11 DATE 21/ 8/75
POSITION 49-21.0N 135-40.0W GMT 20.5
RESULTS OF XBT CAST 137 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.01	132	5.94	396	4.07
5	12.96	137	5.94	397	4.07
11	12.91	145	5.83	401	4.07
19	12.91	151	5.83	409	4.07
22	12.91	167	5.83	414	4.07
24	12.86	177	5.83	426	4.02
26	12.80	184	5.77	430	3.96
27	12.70	187	5.72	435	3.91
28	12.55	191	5.67	445	3.96
29	12.29	192	5.67	451	3.96
31	11.98	193	5.61	475	3.91
32	11.78	195	5.61	506	3.80
33	11.47	198	5.61	539	3.74
34	11.21	201	5.67	545	3.74
35	10.54	203	5.61	549	3.74
37	10.18	205	5.61	551	3.68
38	9.81	207	5.56	558	3.68
39	9.60	212	5.50	562	3.68
40	9.29	215	5.45	567	3.74
42	8.92	221	5.34	571	3.68
44	8.55	223	5.34	582	3.74
46	8.24	226	5.23	589	3.68
47	8.03	232	5.12	592	3.68
48	7.87	239	5.01	598	3.68
50	7.65	248	5.01	602	3.68
52	7.60	261	4.96	605	3.63
54	7.55	269	4.96	607	3.63
56	7.55	273	4.90	612	3.63
57	7.44	280	4.85	628	3.63
59	7.23	286	4.85	653	3.57
62	7.07	289	4.74	663	3.57
67	6.91	300	4.63	669	3.57
73	6.75	310	4.57	673	3.52
76	6.69	325	4.52	678	3.46
82	6.69	333	4.52	685	3.46
85	6.69	338	4.46	698	3.46
87	6.69	341	4.41	708	3.46
90	6.64	346	4.41	712	3.41
93	6.53	349	4.35	720	3.46
96	6.42	352	4.35	731	3.46
99	6.37	377	4.30	739	3.41
101	6.32	382	4.24	741	3.41
104	6.21	387	4.24	744	3.41
107	6.10	388	4.24	747	3.41
110	5.99	391	4.18	749	3.41
120	5.94	395	4.13		


TEMPERATURE, C
0
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12
16
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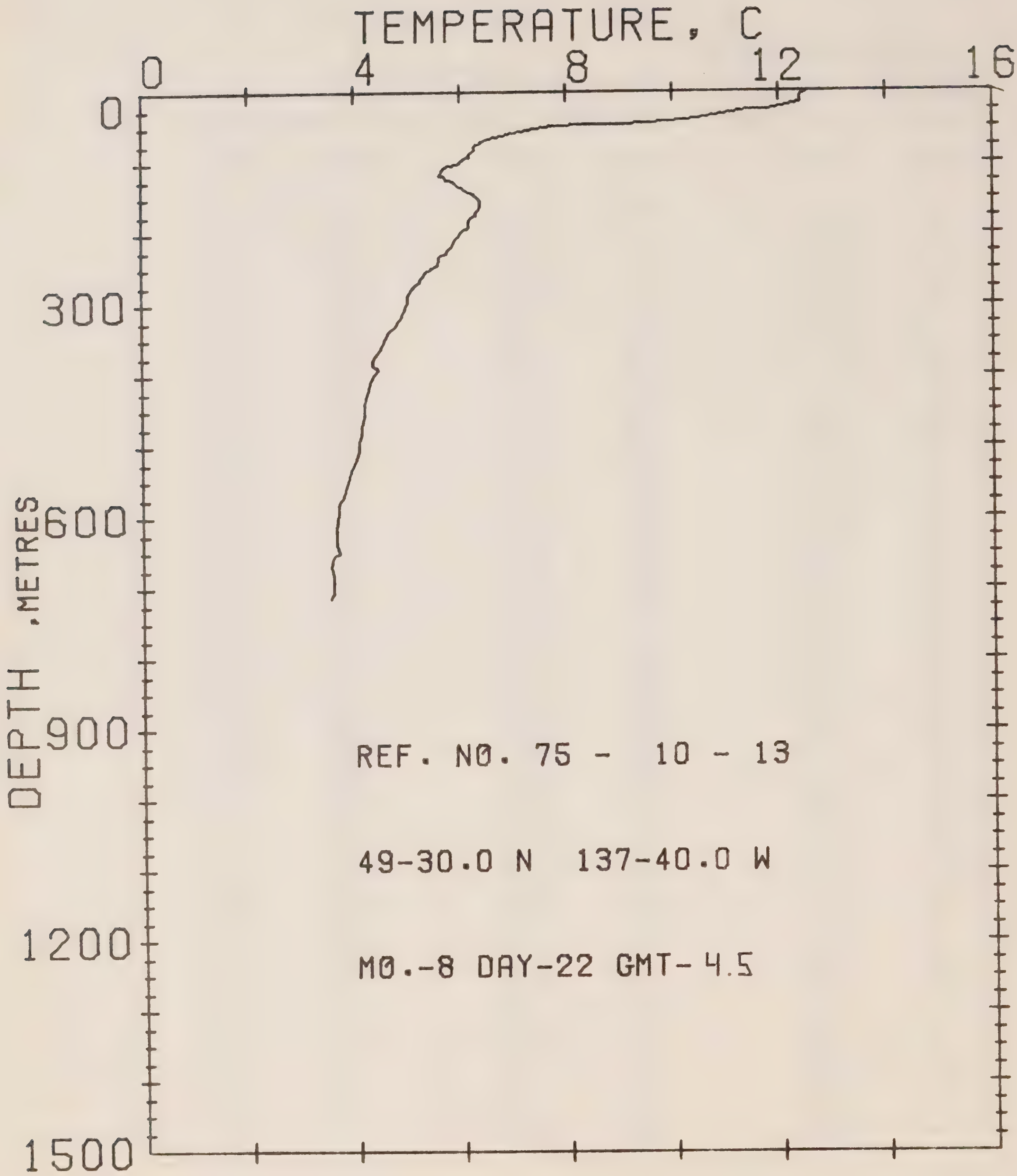
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 12
49-26.0 N 136-40.0 W
MO.-8 DAY-22 GMT- .9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 12 DATE 22/ 8/75
POSITION 49-26.0N 136-40.0W GMT 0.9
RESULTS OF XBT CAST 119 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.65	77	6.53	282	4.63
1	12.60	82	6.42	286	4.63
5	12.50	87	6.32	302	4.52
6	12.50	91	6.32	310	4.41
8	12.60	97	6.26	314	4.41
9	12.70	104	6.15	324	4.41
10	12.70	110	6.05	330	4.41
11	12.65	117	5.99	334	4.41
14	12.60	121	5.99	339	4.35
19	12.60	138	5.88	344	4.30
21	12.55	149	5.83	352	4.24
24	12.55	150	5.77	356	4.24
25	12.45	156	5.72	365	4.24
26	12.40	158	5.72	368	4.24
27	12.19	164	5.77	373	4.24
29	12.09	168	5.72	379	4.24
32	11.98	172	5.67	386	4.24
33	11.93	176	5.61	392	4.18
34	11.88	181	5.61	404	4.18
36	11.52	186	5.61	415	4.13
37	10.80	190	5.50	419	4.13
38	10.59	194	5.39	434	4.02
40	10.28	199	5.34	450	4.07
42	9.76	203	5.28	461	4.02
44	9.19	208	5.28	471	3.91
45	8.92	212	5.23	488	3.91
46	8.50	218	5.18	510	3.85
47	8.34	223	5.12	560	3.85
48	8.03	227	5.07	590	3.85
49	7.81	232	4.96	602	3.80
52	7.71	236	4.96	610	3.85
53	7.65	241	4.90	661	3.68
55	7.50	247	4.90	672	3.68
56	7.34	257	4.79	687	3.63
59	7.23	259	4.79	698	3.63
60	7.12	262	4.79	713	3.63
62	6.96	265	4.74	723	3.57
65	6.85	269	4.74	734	3.57
69	6.75	273	4.68	742	3.52
74	6.64	277	4.68		


TEMPERATURE, C
0
4
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12
16
0
300
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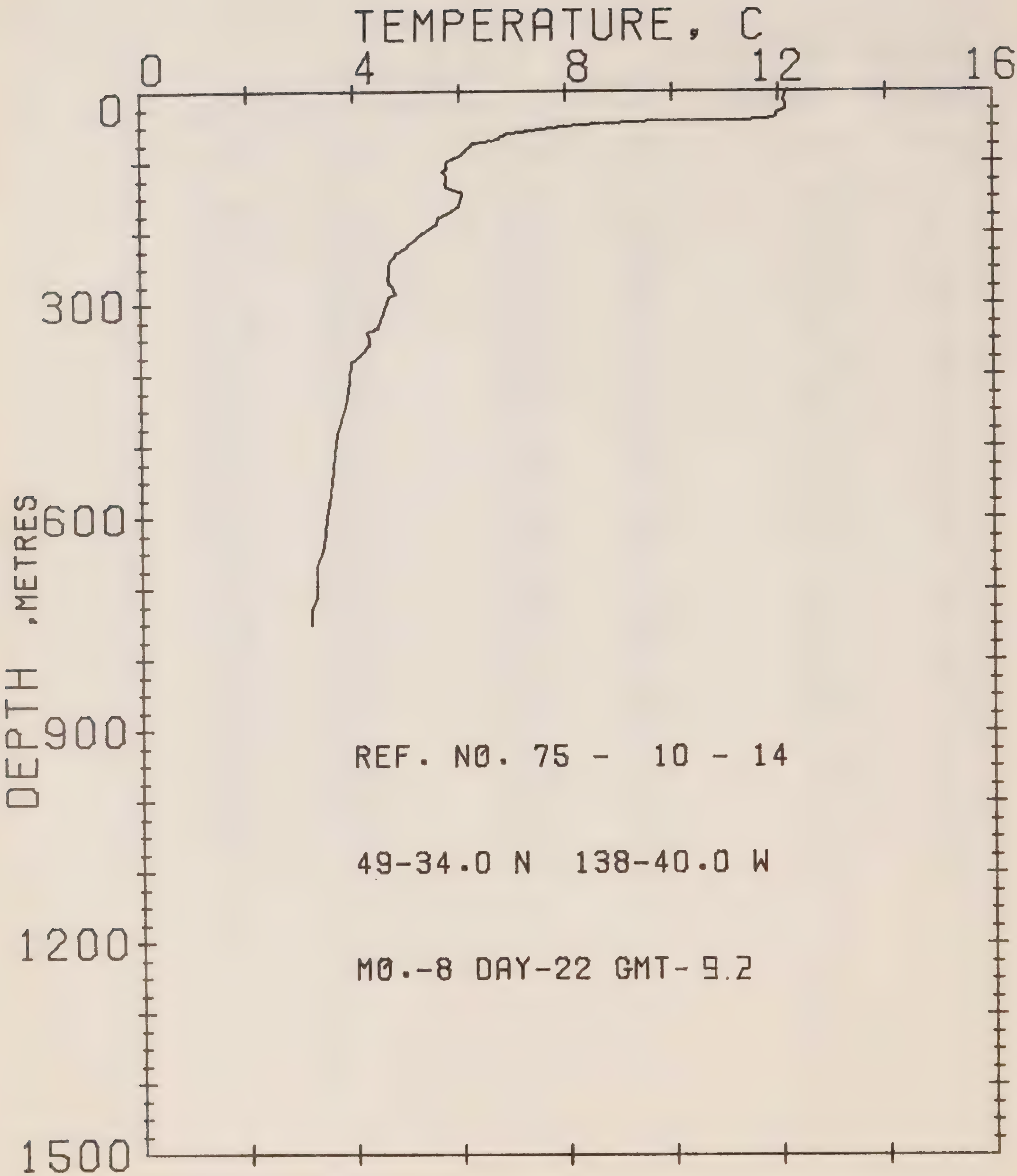
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 13
49-30.0 N 137-40.0 W
MO.-8 DAY-22 GMT- 4.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 13 DATE 22/ 8/75
POSITION 49-30.0N 137-40.0W GMT 4.5
RESULTS OF XBT CAST 86 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.50	111	5.67	372	4.41
5	12.45	117	5.61	379	4.35
9	12.40	119	5.67	386	4.35
17	12.40	123	5.72	392	4.46
20	12.19	127	5.83	402	4.35
23	11.93	137	6.05	413	4.30
25	11.78	147	6.26	440	4.18
27	11.47	154	6.37	457	4.18
28	11.26	163	6.37	472	4.13
32	10.95	173	6.26	483	4.13
38	10.49	182	6.15	495	4.07
42	9.92	190	6.15	506	4.07
46	9.08	200	5.99	517	4.02
47	8.40	227	5.72	535	3.91
49	7.78	232	5.61	556	3.85
53	7.28	239	5.61	571	3.80
58	7.01	244	5.56	583	3.68
60	6.91	251	5.45	592	3.68
63	6.69	256	5.34	617	3.63
66	6.53	268	5.23	637	3.63
72	6.37	276	5.12	649	3.68
77	6.26	286	5.01	651	3.68
82	6.26	297	5.01	657	3.57
89	6.15	306	4.96	670	3.52
93	6.15	317	4.90	684	3.57
95	6.05	328	4.79	700	3.57
99	5.99	341	4.63	709	3.57
104	5.83	352	4.57	714	3.52
107	5.72	362	4.52		


TEMPERATURE, C
0
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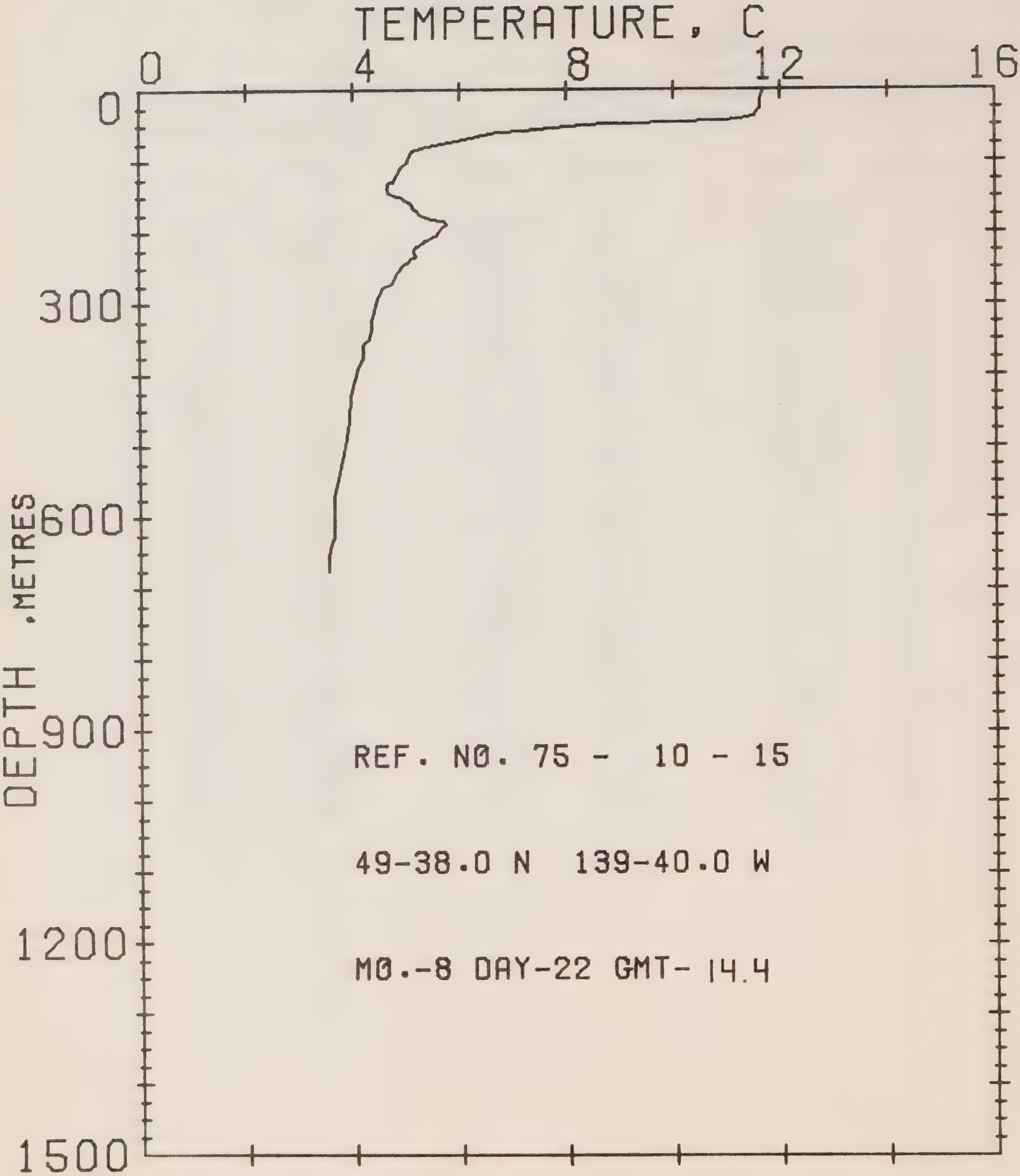
8
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 14
49-34.0 N 138-40.0 W
MO.-8 DAY-22 GMT- 9.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 14 DATE 22/ 8/75
POSITION 49-34.0N 138-40.0W GMT 9.2
RESULTS OF XBT CAST 78 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.19	97	5.88	281	4.74
3	12.14	99	5.77	286	4.79
8	12.14	111	5.77	291	4.68
14	12.09	114	5.67	298	4.63
18	12.14	120	5.77	333	4.46
23	12.14	123	5.77	336	4.41
26	12.14	131	5.72	341	4.24
28	12.09	136	5.77	348	4.30
33	11.98	139	5.88	353	4.30
35	11.98	142	5.99	356	4.30
39	11.78	144	6.05	358	4.30
41	11.16	148	6.05	371	4.13
43	9.76	162	5.99	382	3.96
46	8.82	170	5.83	408	3.91
47	8.61	173	5.77	444	3.85
49	8.34	177	5.67	483	3.68
51	7.97	180	5.61	510	3.63
54	7.55	188	5.56	550	3.57
59	6.96	202	5.28	579	3.52
62	6.85	220	5.01	601	3.46
67	6.75	230	4.79	640	3.41
73	6.48	243	4.68	669	3.29
74	6.26	256	4.68	693	3.29
79	6.21	267	4.63	711	3.29
86	6.10	273	4.68	729	3.18
91	6.05	278	4.74	749	3.18


TEMPERATURE, C
0
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12
16
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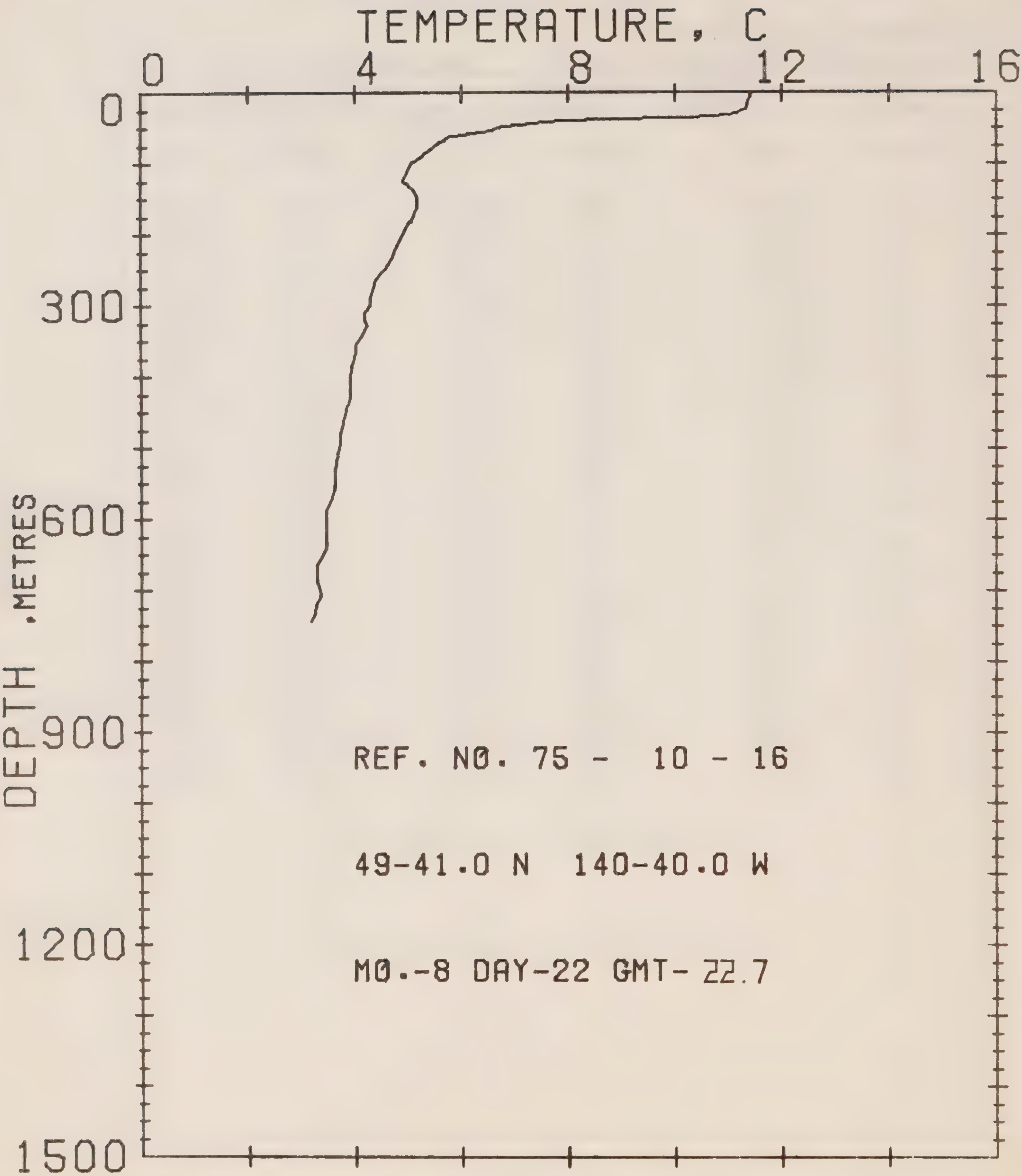
300
600
900
1200
1500
DEPTH .METRES
REF. NO. 75 - 10 - 15
49-38.0 N 139-40.0 W
MO.-8 DAY-22 GMT- 14.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 15 DATE 22/ 8/75
POSITION 49-38.0N 139-40.0W GMT 14.4
RESULTS OF XBT CAST 75 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.68	102	5.01	240	5.07
3	11.68	111	4.90	249	4.90
16	11.62	129	4.74	261	4.79
28	11.62	133	4.63	272	4.74
33	11.57	137	4.63	277	4.57
38	11.52	142	4.63	295	4.46
40	11.42	147	4.68	312	4.41
42	11.26	150	4.79	324	4.35
44	10.90	152	4.90	337	4.35
45	10.70	156	4.96	349	4.30
46	10.28	161	5.07	358	4.18
47	9.81	165	5.12	370	4.18
48	9.39	168	5.12	378	4.18
49	8.82	171	5.18	392	4.07
50	8.34	177	5.23	409	4.02
52	8.03	181	5.45	429	3.96
54	7.76	184	5.67	465	3.91
56	7.44	187	5.72	501	3.85
56	7.23	189	5.77	538	3.74
60	6.75	194	5.67	572	3.63
62	6.59	203	5.56	598	3.63
68	6.21	214	5.34	628	3.63
83	5.28	221	5.18	636	3.57
87	5.12	229	5.12	657	3.52
92	5.07	234	5.18	675	3.52


TEMPERATURE, C
0
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8
12
16
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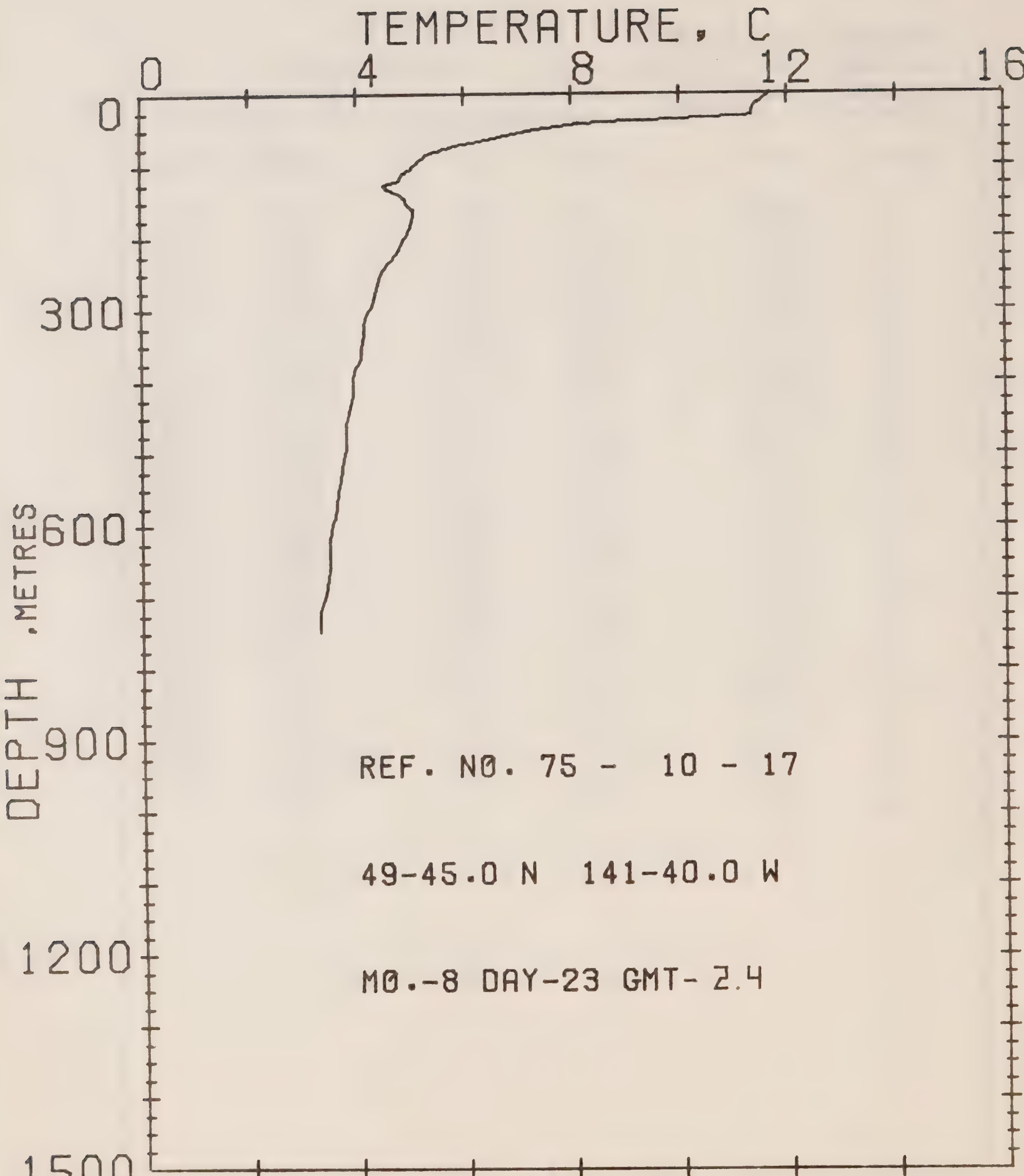
300
600
900
1200
1500
DEPTH ,METRES
REF. N0. 75 - 10 - 16
49-41.0 N 140-40.0 W
M0.-8 DAY-22 GMT- 22.7

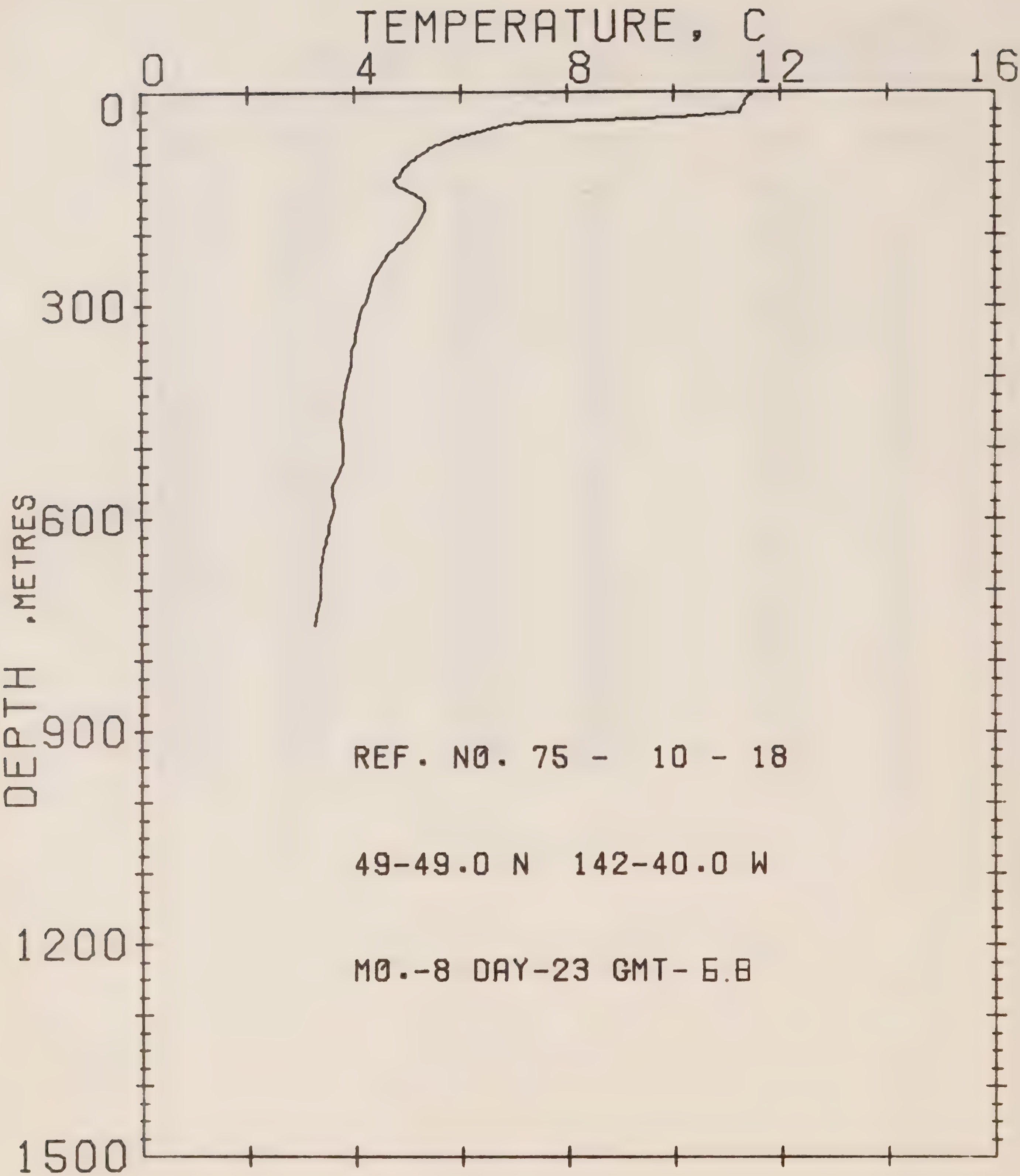
OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 16   DATE 22/ 8/75
POSITION 49-41.0N 140-40.0W   GMT 22.7
RESULTS OF XBT CAST   76 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.42	99	5.07	404	3.91
6	11.42	126	4.90	429	3.91
15	11.37	133	5.01	446	3.85
19	11.37	140	5.12	464	3.80
24	11.32	148	5.18	481	3.74
26	11.21	163	5.18	495	3.74
31	11.16	183	5.07	508	3.68
33	11.01	185	5.01	532	3.63
34	10.70	216	4.79	543	3.63
35	10.28	226	4.74	558	3.63
36	9.86	242	4.63	571	3.57
40	7.87	264	4.41	587	3.46
41	7.65	277	4.35	598	3.46
42	7.55	291	4.30	621	3.46
44	7.39	299	4.30	631	3.46
46	7.07	306	4.24	642	3.46
48	6.80	310	4.18	656	3.35
50	6.69	317	4.18	665	3.29
53	6.59	323	4.18	679	3.29
56	6.37	327	4.24	688	3.29
62	5.83	336	4.18	705	3.35
64	5.72	344	4.13	709	3.35
67	5.67	354	4.02	722	3.29
73	5.56	367	4.02	733	3.24
81	5.39	386	3.96	743	3.18
89	5.28				


TEMPERATURE, C
0
4
8
12
16
DEPTH ,METRES
0
300
600
900
1200
1500
REF. NO. 75 - 10 - 17
49-45.0 N 141-40.0 W
MO.-8 DAY-23 GMT- 2.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 17   DATE 23/ 8/75
POSITION 49-45.0N 141-40.0W   GMT 2.4
RESULTS OF XBT CAST   76 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.68	103	5.01	294	4.30
5	11.62	110	4.90	305	4.18
11	11.52	113	4.85	320	4.13
14	11.47	120	4.79	335	4.13
16	11.42	123	4.63	353	4.07
21	11.37	125	4.52	368	4.07
24	11.37	128	4.52	383	3.96
26	11.37	132	4.57	398	3.91
30	11.32	136	4.68	417	3.91
32	11.26	140	4.79	442	3.85
33	11.06	144	4.85	460	3.80
36	9.86	147	4.90	492	3.80
37	9.45	152	4.90	508	3.74
38	9.08	156	4.96	536	3.68
39	8.66	159	5.01	554	3.63
43	8.13	161	5.07	590	3.57
46	7.76	167	5.07	596	3.52
51	7.34	184	5.01	621	3.46
57	6.80	194	4.96	660	3.46
60	6.69	206	4.85	685	3.41
67	6.15	217	4.79	703	3.35
73	5.83	222	4.74	720	3.29
78	5.56	237	4.57	736	3.29
82	5.39	249	4.46	743	3.29
87	5.28	264	4.41	747	3.29
96	5.12				


TEMPERATURE, C
0
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12
16
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300
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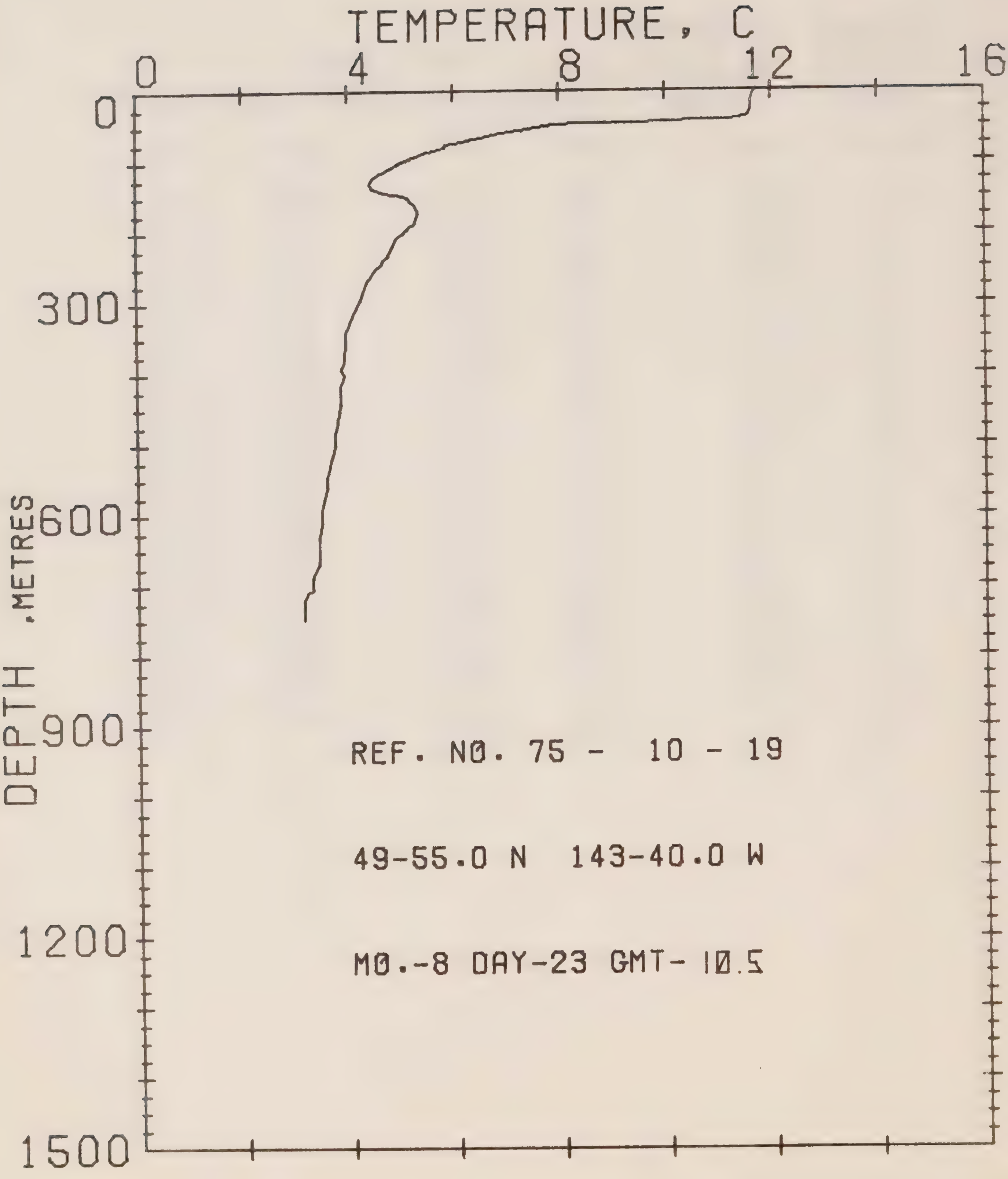
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 18
49-49.0 N 142-40.0 W
MO.-8 DAY-23 GMT- 6.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 18 DATE 23/ 8/75
POSITION 49-49.0N 142-40.0W GMT 6.8
RESULTS OF XBT CAST 71 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.47	123	4.74	412	3.85
3	11.47	126	4.74	438	3.80
6	11.42	133	4.79	465	3.74
13	11.32	137	4.96	500	3.80
18	11.32	145	5.18	522	3.80
23	11.26	151	5.28	533	3.74
27	11.26	156	5.34	547	3.63
30	11.21	165	5.34	554	3.57
33	10.75	174	5.28	567	3.57
36	10.07	183	5.23	582	3.63
38	9.29	193	5.12	597	3.57
41	7.81	203	5.01	610	3.52
42	7.34	216	4.79	621	3.52
45	7.07	229	4.63	629	3.46
49	6.75	245	4.52	634	3.46
58	6.26	261	4.35	644	3.41
66	5.83	280	4.30	667	3.35
71	5.67	294	4.24	696	3.35
75	5.50	305	4.13	713	3.35
82	5.39	325	4.07	737	3.29
92	5.18	340	4.02	743	3.29
102	5.01	351	4.02	746	3.24
111	4.90	363	3.96	749	3.24
118	4.85	383	3.96		


TEMPERATURE, C
0
4
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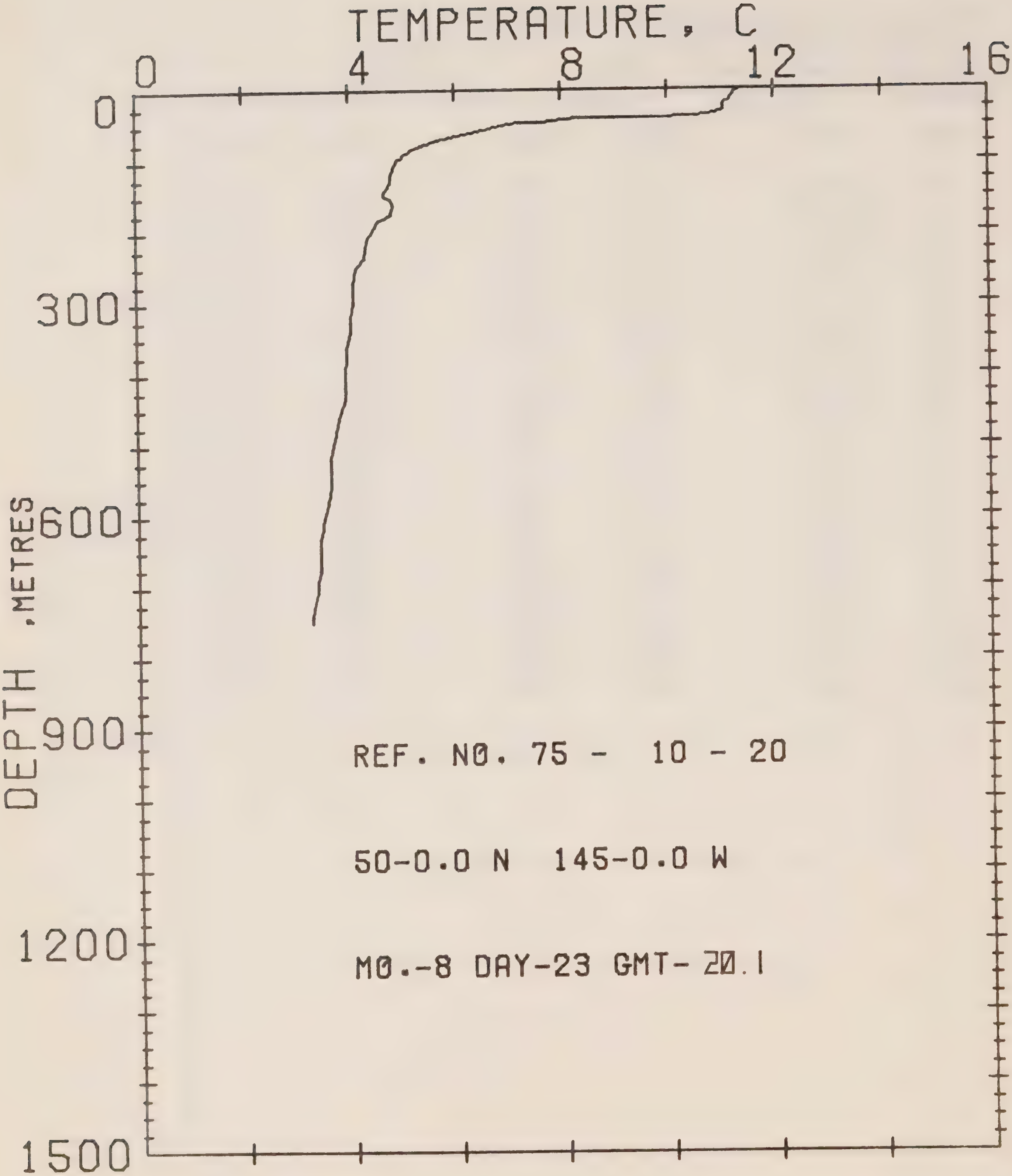
12
16
0
300
600
900
1200
1500
DEPTH .METRES
REF. NO. 75 - 10 - 19
49-55.0 N 143-40.0 W
MO.-8 DAY-23 GMT- 10.5

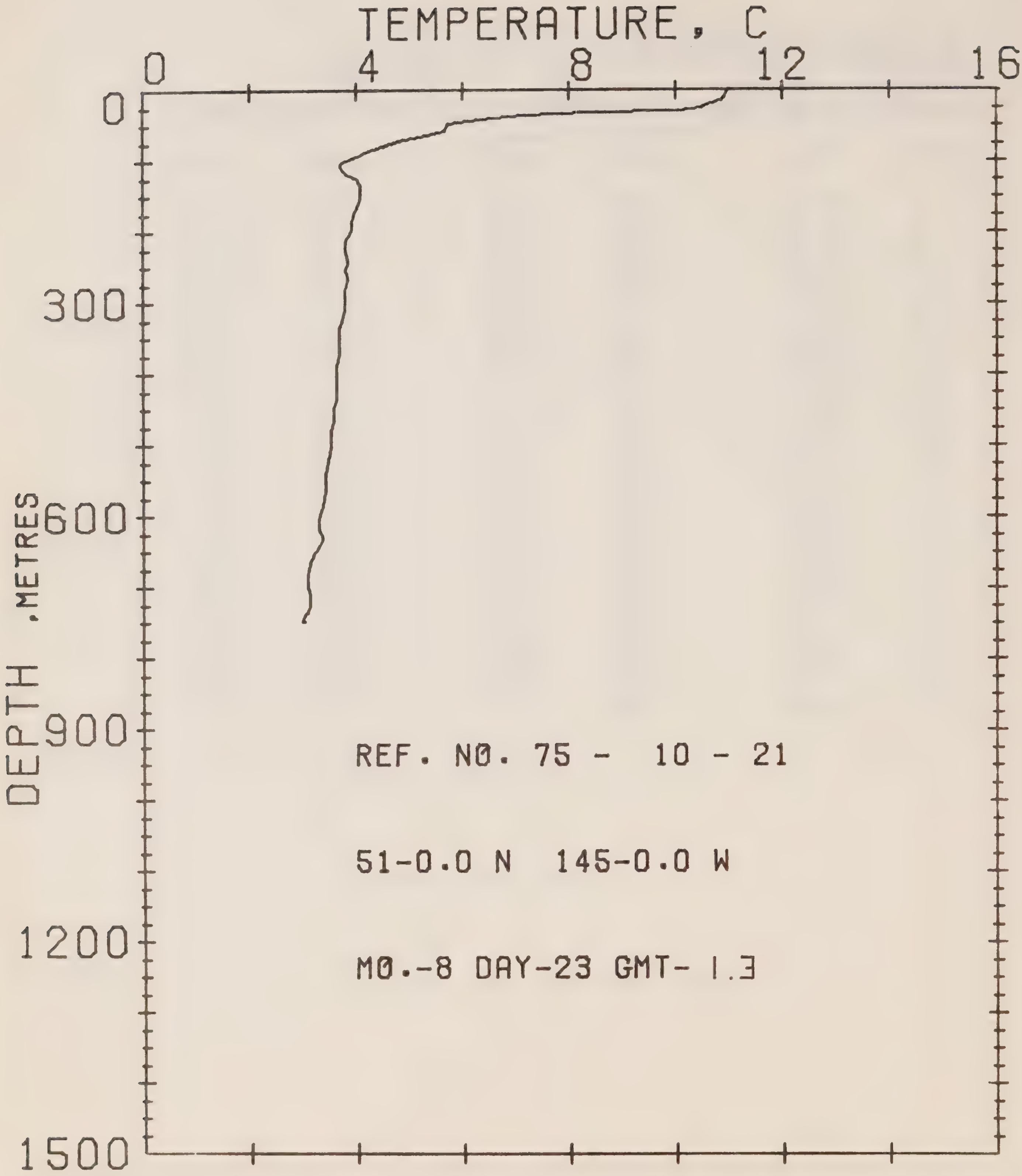
OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 19 DATE 23/ 8/75
POSITION 49-55.0N 143-40.0W GMT 10.5
RESULTS OF XBT CAST 66 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.73	132	4.41	395	3.85
5	11.68	138	4.46	403	3.91
16	11.62	143	4.68	419	3.85
30	11.62	146	4.85	441	3.85
35	11.57	148	5.01	468	3.80
39	11.42	151	5.12	484	3.74
42	11.16	156	5.18	499	3.74
43	10.70	164	5.28	516	3.68
46	9.39	173	5.34	546	3.57
47	8.45	186	5.28	563	3.57
49	7.92	196	5.12	577	3.52
53	7.44	209	4.90	595	3.46
60	6.91	233	4.74	612	3.46
72	6.15	254	4.52	631	3.41
76	5.88	271	4.35	650	3.41
80	5.83	296	4.24	671	3.41
88	5.45	318	4.07	688	3.29
95	5.18	342	3.96	706	3.29
101	4.96	353	3.96	712	3.18
109	4.79	361	3.96	722	3.13
119	4.57	370	3.91	736	3.13
127	4.46	383	3.91	747	3.13


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 20
50-0.0 N 145-0.0 W
MO.-8 DAY-23 GMT- 20.1

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 20 DATE 23/ 8/75
POSITION 50- 0.0N 145- 0.0W GMT 20.1
RESULTS OF XBT CAST 65 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP
1	11.32
2	11.32
9	11.25
16	11.16
21	11.06
27	11.06
31	11.06
34	10.90
37	10.54
39	9.71
40	8.34
41	8.08
44	7.87
46	7.65
47	7.23
50	6.91
54	6.69
61	6.32
70	5.67
76	5.39
84	5.18
94	5.01
100	4.90
120	4.79
130	4.79
136	4.74
143	4.68
149	4.68
154	4.79
162	4.85
173	4.79
185	4.57
198	4.46
209	4.35
236	4.30
249	4.13
271	4.07
298	4.07
320	4.02
340	4.02
362	3.96
376	3.96
396	3.91
416	3.91
434	3.91
449	3.85
461	3.80
482	3.74
498	3.66
519	3.63
537	3.63
555	3.63
580	3.57
596	3.52
610	3.46
619	3.46
632	3.41
650	3.41
675	3.41
694	3.35
707	3.35
730	3.29
741	3.24
747	3.24
749	3.24


TEMPERATURE, C
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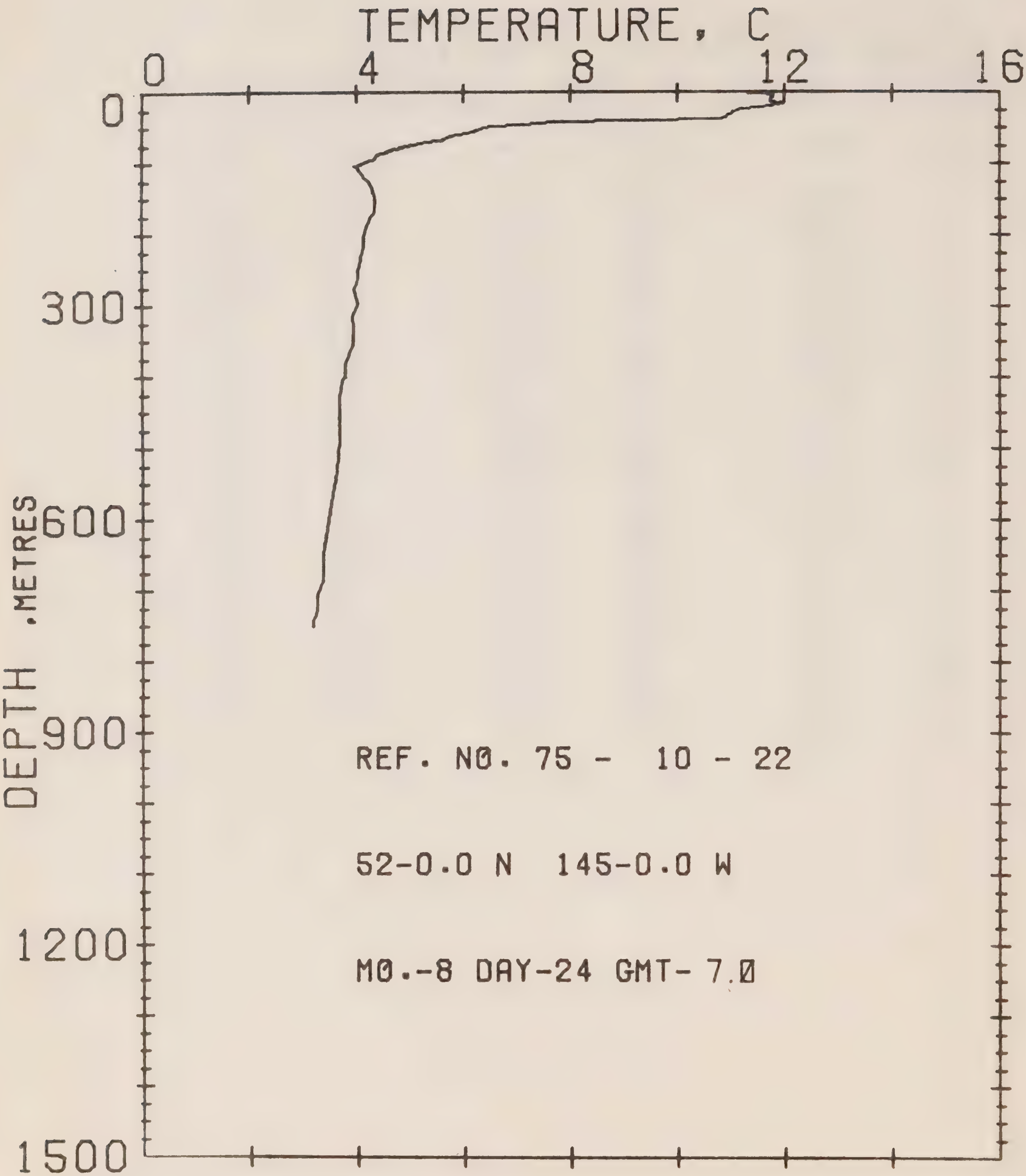
DEPTH ,METRES
REF. NO. 75 - 10 - 21
51-0.0 N 145-0.0 W
MO.-8 DAY-23 GMT- 1.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 21 DATE 23/ 8/75
POSITION 51- 0.0N 145- 0.0W GMT 1.3
RESULTS OF XBT CAST 71 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.01	127	4.02	435	3.63
4	10.95	130	4.02	447	3.57
11	10.90	134	4.07	465	3.57
15	10.85	139	4.07	480	3.52
18	10.75	144	4.07	502	3.52
22	10.59	155	4.07	522	3.46
26	10.49	165	4.02	542	3.41
29	10.33	177	3.96	562	3.41
30	10.02	187	3.91	585	3.35
33	8.40	198	3.91	604	3.29
36	7.18	214	3.80	619	3.29
39	6.59	226	3.80	631	3.35
44	6.10	243	3.85	644	3.29
48	5.72	254	3.80	656	3.18
58	5.67	266	3.85	666	3.13
64	5.34	284	3.80	681	3.07
73	4.79	311	3.80	700	3.07
87	4.24	325	3.74	713	3.13
96	3.96	333	3.68	725	3.13
101	3.74	349	3.68	735	3.07
108	3.68	371	3.68	740	3.01
114	3.74	388	3.63	747	2.96
119	3.80	403	3.63	748	3.01
123	3.96	423	3.63		


TEMPERATURE, C
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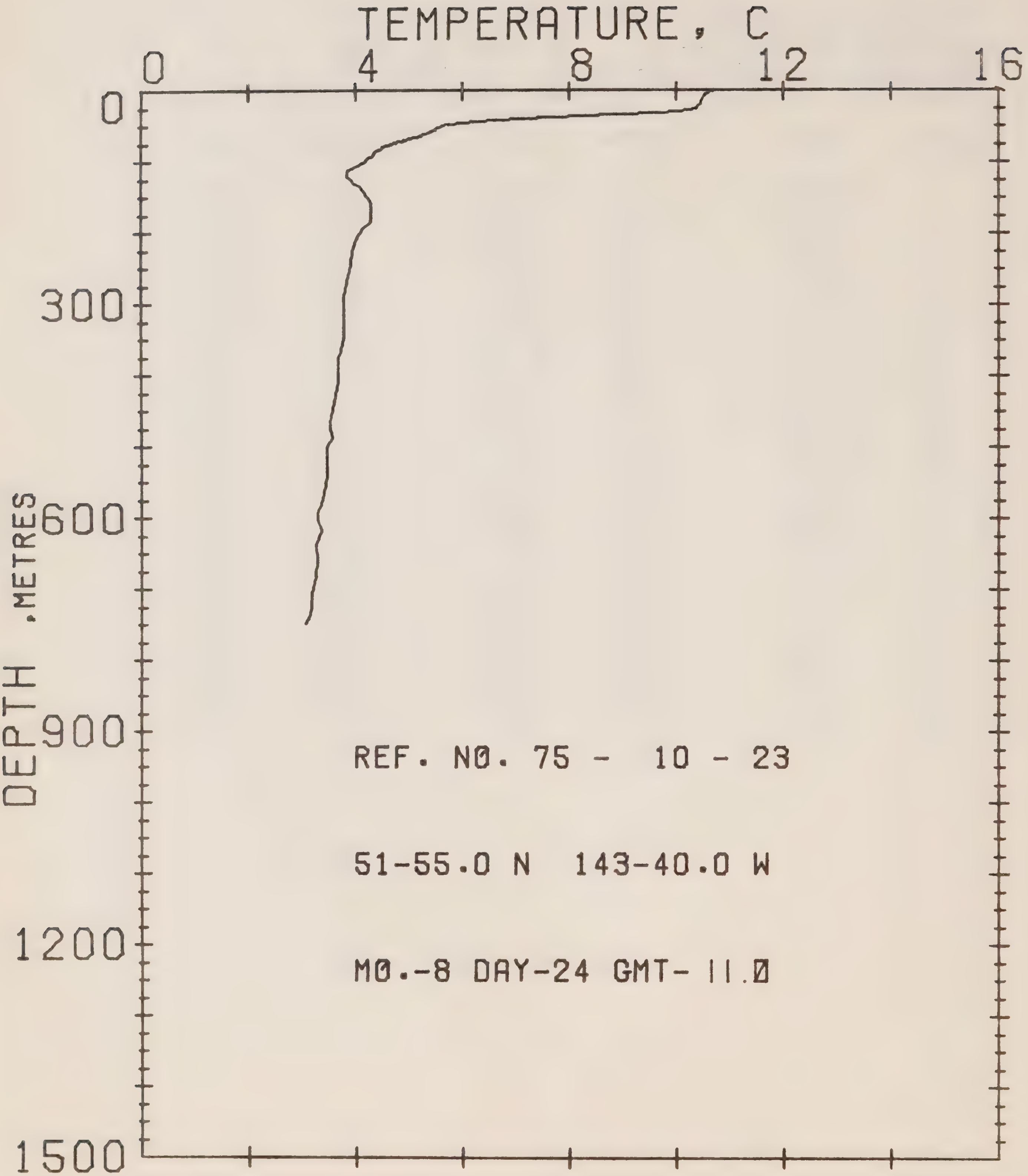
DEPTH ,METRES
REF. N0. 75 - 10 - 22
52-0.0 N 145-0.0 W
M0.-8 DAY-24 GMT- 7.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 22 DATE 24/ 8/75
POSITION 52- 0.0N 145- 0.0W GMT 7.0
RESULTS OF XBT CAST 70 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.32	67	5.61	277	3.96
2	11.57	69	5.50	298	4.02
4	11.68	74	5.07	316	3.91
5	11.78	77	4.85	327	3.96
8	11.76	82	4.63	344	3.96
11	11.73	88	4.41	354	3.96
14	11.73	94	4.35	382	3.80
15	11.83	98	4.18	399	3.80
16	11.93	101	4.07	404	3.74
17	11.98	104	3.96	428	3.68
19	11.88	111	4.02	455	3.68
21	11.57	121	4.13	487	3.68
23	11.21	128	4.24	531	3.63
27	11.11	137	4.30	554	3.57
31	11.01	150	4.35	575	3.52
35	10.90	167	4.35	603	3.46
37	10.80	179	4.24	623	3.41
43	7.71	190	4.18	650	3.35
46	7.12	203	4.13	685	3.35
49	6.53	217	4.13	706	3.24
52	6.32	233	4.07	728	3.24
56	6.21	251	4.02	744	3.18
58	6.05	262	4.02	749	3.18
62	5.77				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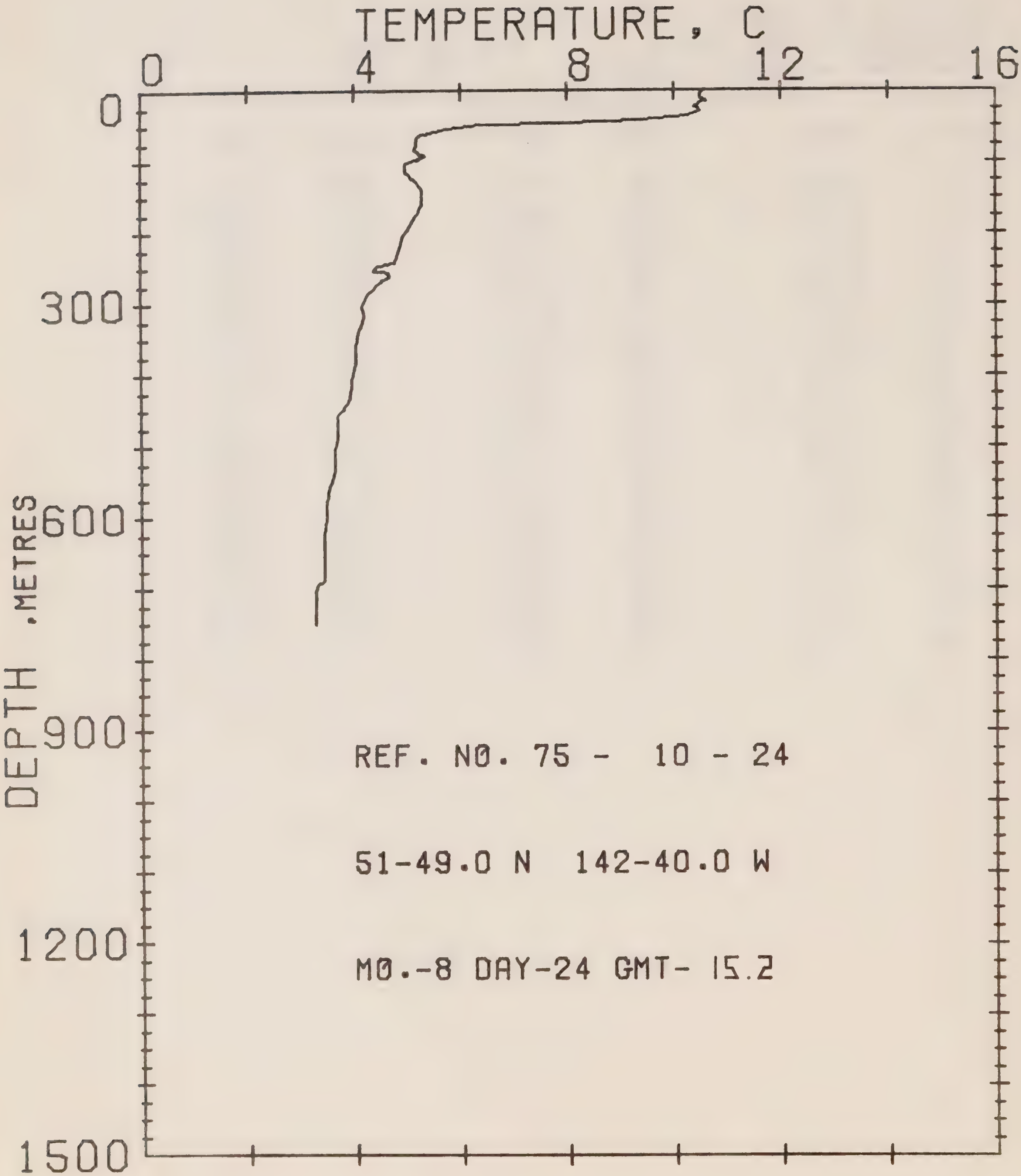
DEPTH ,METRES
REF. NO. 75 - 10 - 23
51-55.0 N 143-40.0 W
MO.-8 DAY-24 GMT- 11.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 23   DATE 24/ 8/75
POSITION 51-55.0N 143-40.0W   GMT 11.0
RESULTS OF XBT CAST   60 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	10.70	122	3.85	428	3.63
8	10.54	130	3.96	447	3.57
14	10.49	136	4.07	464	3.52
20	10.44	148	4.18	475	3.52
27	10.38	158	4.30	489	3.57
29	10.28	170	4.30	499	3.46
32	9.71	185	4.30	517	3.46
34	8.87	197	4.13	540	3.46
39	7.12	208	4.02	564	3.41
44	6.26	226	3.96	582	3.35
46	5.77	244	3.91	591	3.29
50	5.61	270	3.85	602	3.29
56	5.50	291	3.80	619	3.35
64	5.23	308	3.80	639	3.24
74	4.74	330	3.80	658	3.29
80	4.52	346	3.80	682	3.24
89	4.35	365	3.74	705	3.18
100	4.18	375	3.68	726	3.18
109	3.96	391	3.68	742	3.13
114	3.85	408	3.68	747	3.07


TEMPERATURE, C
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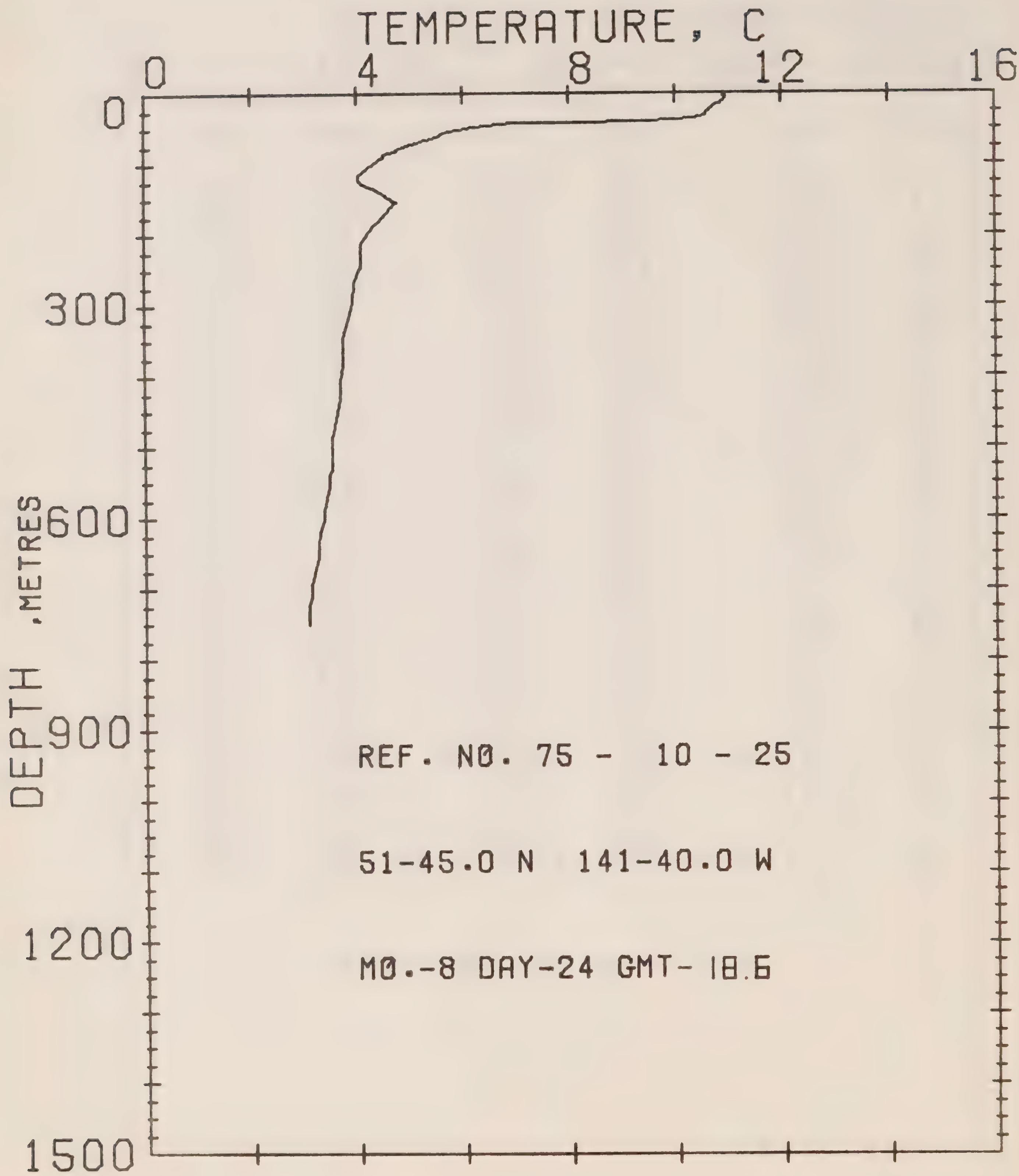
DEPTH .METRES
REF. NO. 75 - 10 - 24
51-49.0 N 142-40.0 W
MO.-8 DAY-24 GMT- 15.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 24 DATE 24/ 8/75
POSITION 51-49.0N 142-40.0W GMT 15.2
RESULTS OF XBT CAST 91 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	10.59	98	5.18	316	4.18
2	10.54	99	5.07	331	4.13
6	10.49	104	4.96	339	4.07
11	10.49	108	4.96	359	4.02
13	10.54	113	4.96	382	4.02
14	10.59	116	4.96	409	3.96
16	10.59	119	5.01	433	3.91
18	10.49	123	5.07	448	3.80
20	10.44	127	5.12	457	3.68
23	10.38	140	5.28	469	3.68
25	10.44	152	5.28	487	3.68
28	10.44	161	5.28	507	3.63
30	10.44	170	5.23	532	3.63
31	10.49	182	5.12	548	3.57
35	10.28	195	5.01	559	3.52
42	9.39	207	4.90	580	3.46
45	8.71	223	4.85	601	3.46
47	7.92	235	4.79	624	3.41
49	6.37	242	4.74	637	3.41
53	5.77	244	4.63	656	3.41
59	5.45	246	4.46	672	3.41
64	5.23	249	4.41	687	3.41
69	5.18	253	4.35	696	3.29
77	5.18	254	4.52	704	3.24
84	5.12	256	4.63	725	3.24
86	5.18	259	4.68	739	3.24
89	5.23	261	4.68	745	3.24
91	5.28	269	4.52	747	3.24
92	5.34	287	4.24	748	3.24
94	5.28	303	4.13	749	3.24
97	5.23				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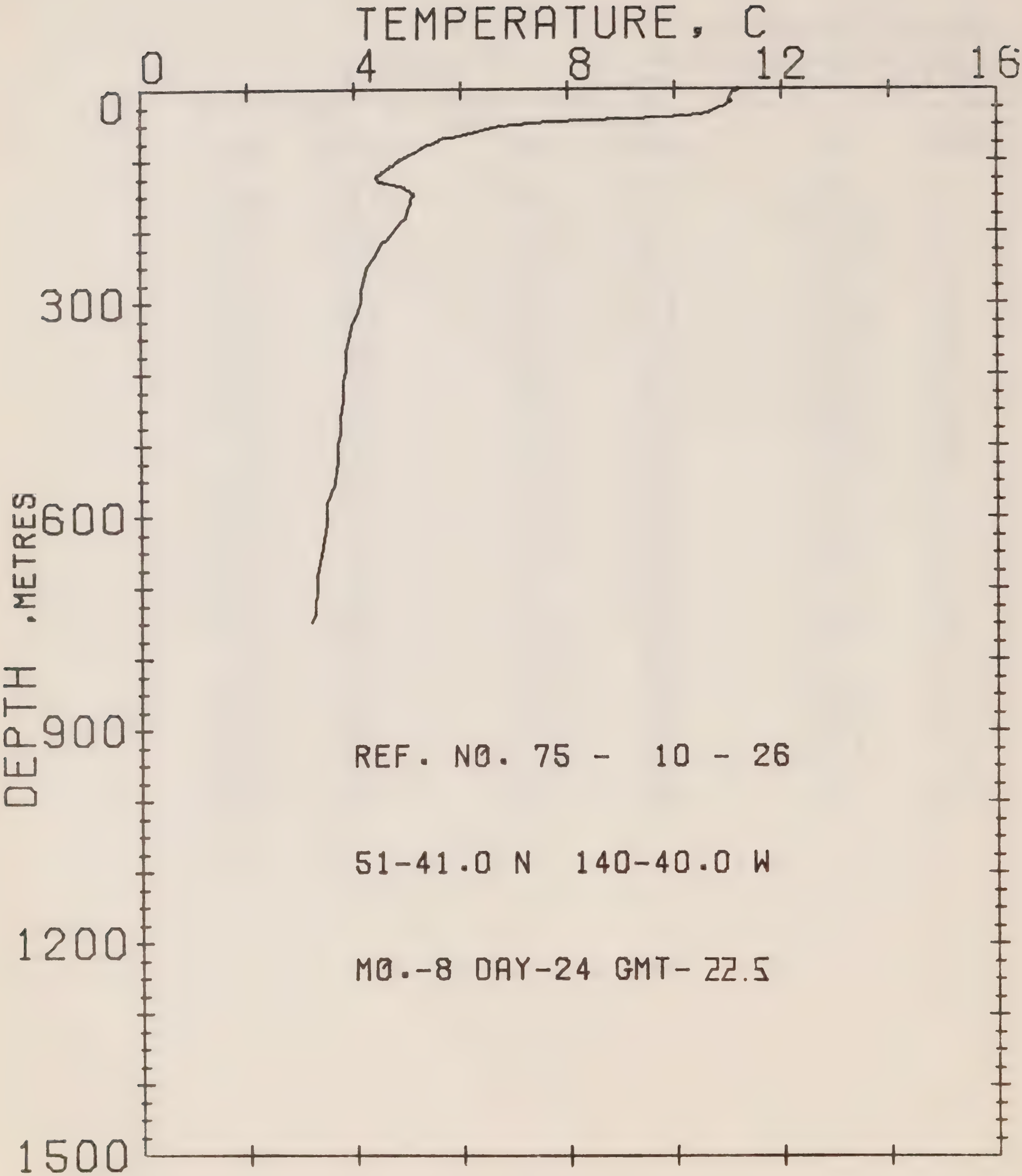
DEPTH ,METRES
REF. NO. 75 - 10 - 25
51-45.0 N 141-40.0 W
MO.-8 DAY-24 GMT- 18.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 25 DATE 24/ 8/75
POSITION 51-45.0N 141-40.0W GMT 18.6
RESULTS OF XBT CAST 78 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
3	10.90	80	4.74	430	3.68
6	10.95	83	4.74	450	3.63
9	10.95	86	4.52	471	3.57
12	10.90	91	4.52	487	3.52
15	10.85	116	4.02	501	3.52
18	10.75	118	4.02	516	3.52
22	10.70	123	4.02	524	3.52
25	10.64	128	4.07	531	3.52
27	10.64	136	4.35	538	3.46
30	10.59	147	4.57	548	3.46
33	10.59	151	4.68	554	3.46
35	10.38	154	4.74	572	3.41
39	9.50	160	4.68	587	3.35
41	7.97	173	4.52	602	3.35
42	7.01	189	4.30	621	3.29
45	6.69	202	4.18	637	3.24
46	6.48	213	4.07	656	3.24
48	6.21	226	4.07	678	3.18
51	6.10	247	4.07	695	3.13
52	5.94	252	4.02	701	3.13
55	5.72	269	3.96	713	3.13
57	5.61	294	3.91	724	3.07
60	5.56	318	3.85	736	3.07
64	5.45	346	3.74	744	3.07
68	5.23	361	3.74	747	3.07
74	4.96	409	3.68	749	3.07



TEMPERATURE, C
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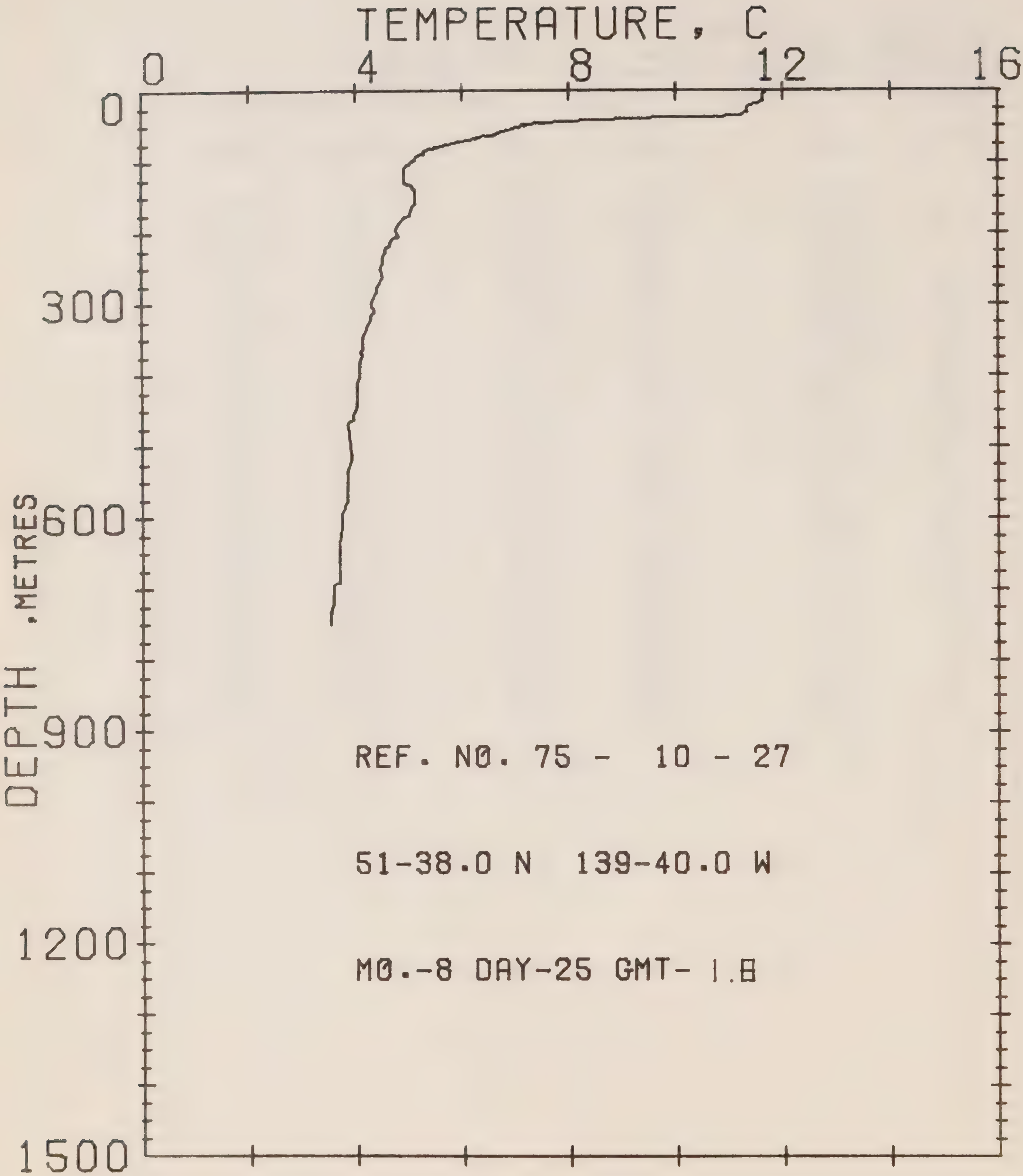
DEPTH .METRES
REF. NO. 75 - 10 - 26
51-41.0 N 140-40.0 W
MO.-8 DAY-24 GMT- 22.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 26 DATE 24/ 8/75
POSITION 51-41.0N 140-40.0W GMT 22.5
RESULTS OF XBT CAST 69 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.21	100	4.85	283	4.13
2	11.16	109	4.68	301	4.13
9	11.06	119	4.52	313	4.07
15	11.01	123	4.41	331	3.96
18	11.06	129	4.46	347	3.91
24	10.95	133	4.57	369	3.85
29	10.80	135	4.74	393	3.85
34	10.64	137	4.90	410	3.80
36	10.49	141	4.96	435	3.80
39	9.81	146	5.07	463	3.74
42	9.08	147	5.12	481	3.74
46	7.71	150	5.12	499	3.68
50	7.01	155	5.07	521	3.68
54	6.59	160	5.07	554	3.63
58	6.42	170	5.01	583	3.46
63	6.10	181	4.96	609	3.46
67	5.83	189	4.85	632	3.41
69	5.67	200	4.74	654	3.35
71	5.61	210	4.63	684	3.29
74	5.56	219	4.52	702	3.29
75	5.50	235	4.41	728	3.24
80	5.34	250	4.24	735	3.24
91	5.12	266	4.18	747	3.18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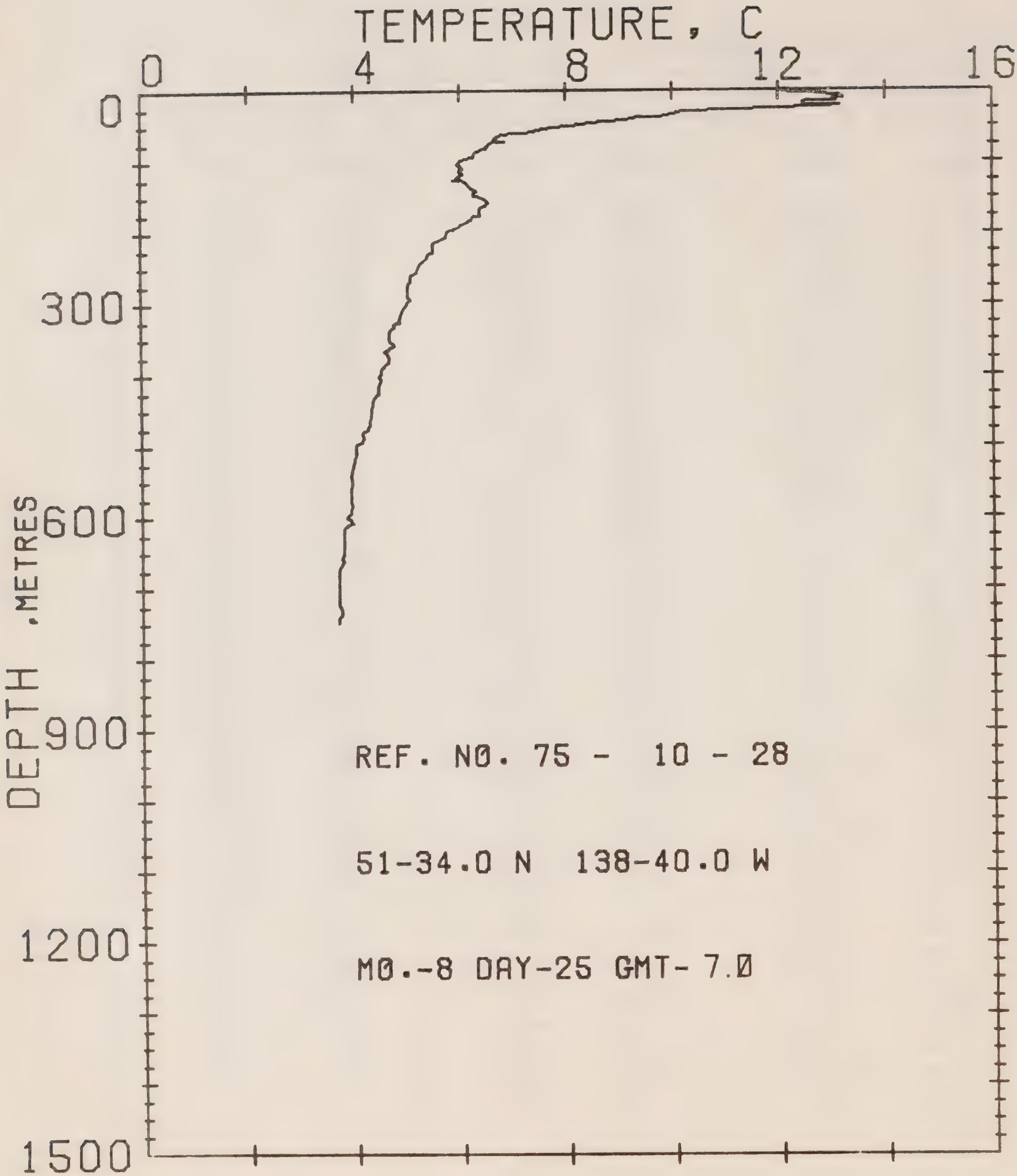
DEPTH ,METRES
REF. NO. 75 - 10 - 27
51-38.0 N 139-40.0 W
MO.-8 DAY-25 GMT- 1.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 27 DATE 25/ 8/75
POSITION 51-38.0N 139-40.0W GMT 1.8
RESULTS OF XBT CAST 113 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
3	11.68	103	5.01	311	4.35
6	11.62	106	4.96	315	4.30
10	11.62	109	4.90	320	4.30
14	11.62	129	4.90	348	4.13
16	11.62	131	4.96	361	4.13
18	11.57	134	5.07	364	4.13
21	11.42	137	5.07	368	4.07
24	11.32	140	5.12	371	4.13
28	11.32	144	5.12	380	4.07
32	11.32	150	5.12	388	4.07
34	11.26	157	5.12	393	4.07
35	11.21	159	5.12	397	4.07
37	10.59	160	5.12	402	4.07
38	9.86	164	5.07	410	4.02
44	7.87	176	5.01	424	4.02
45	7.81	180	4.90	444	4.02
46	7.65	191	4.79	457	3.96
47	7.44	197	4.74	461	3.96
48	7.23	206	4.79	467	3.85
49	7.12	207	4.74	519	3.91
51	7.18	211	4.68	535	3.85
52	7.07	216	4.63	539	3.85
54	6.96	219	4.63	562	3.85
61	6.69	222	4.57	570	3.85
62	6.64	223	4.57	577	3.85
63	6.59	228	4.57	585	3.80
65	6.48	235	4.52	596	3.74
66	6.32	239	4.52	599	3.74
68	6.26	244	4.52	611	3.74
70	6.15	251	4.46	638	3.68
73	5.94	261	4.52	660	3.68
84	5.34	271	4.46	692	3.68
85	5.28	279	4.41	693	3.57
89	5.28	284	4.41	722	3.57
92	5.18	291	4.35	734	3.52
96	5.12	298	4.30	743	3.52
98	5.12	304	4.30	749	3.52
99	5.07	308	4.35		



TEMPERATURE, C
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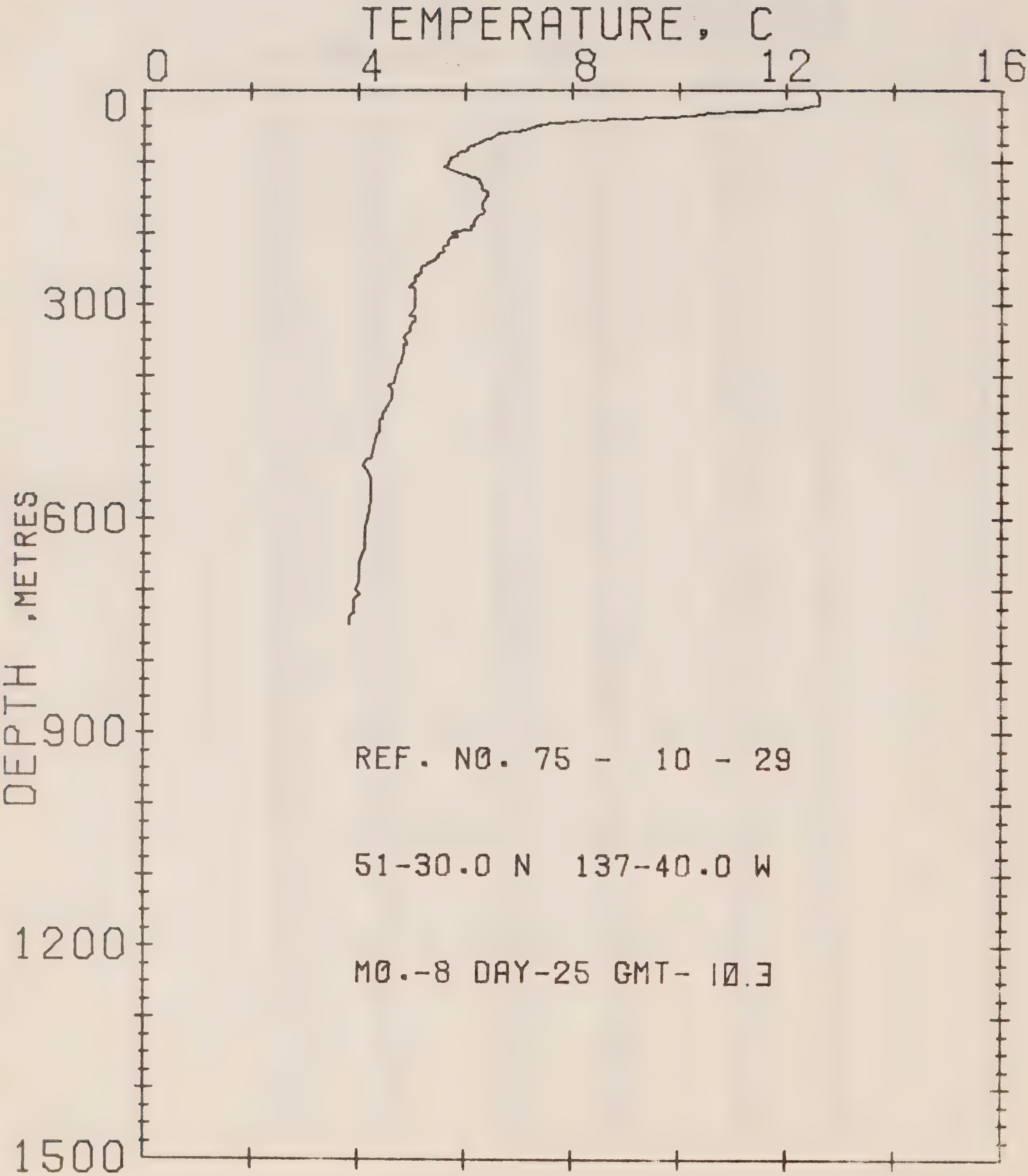
DEPTH ,METRES
REF. NO. 75 - 10 - 28
51-34.0 N 138-40.0 W
MO.-8 DAY-25 GMT- 7.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 28 DATE 25/ 8/75
POSITION 51-34.0N 138-40.0W GMT 7.0 7.0
RESULTS OF XBT CAST 173 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.14	106	5.99	352	4.68
1	12.09	109	6.05	358	4.74
2	12.09	112	5.99	361	4.68
3	12.19	114	5.99	364	4.63
5	12.45	118	6.05	367	4.57
6	12.86	120	5.99	372	4.63
7	12.91	122	5.94	376	4.68
8	13.06	123	5.99	382	4.63
9	13.11	125	5.88	388	4.57
11	13.21	127	5.94	392	4.52
12	13.01	128	6.10	398	4.52
14	13.01	130	6.10	402	4.46
15	13.06	135	6.15	406	4.52
16	12.86	137	6.21	415	4.46
17	12.55	139	6.26	423	4.46
18	12.45	142	6.32	426	4.46
20	12.45	144	6.26	429	4.41
21	12.45	146	6.26	436	4.35
22	13.11	148	6.26	467	4.30
23	12.86	150	6.37	471	4.30
24	12.45	154	6.48	477	4.24
25	12.14	158	6.53	482	4.13
27	11.68	163	6.48	488	4.18
28	11.42	166	6.37	494	4.13
29	10.90	172	6.37	498	4.02
30	10.49	175	6.37	510	4.02
31	10.23	177	6.26	534	3.96
33	10.13	182	6.21	541	3.91
35	9.92	185	6.15	548	3.96
37	9.76	189	5.99	552	3.96
38	9.39	195	5.88	561	3.91
41	9.13	198	5.77	577	3.91
45	8.77	205	5.72	584	3.96
47	8.45	208	5.67	590	3.91
48	8.34	212	5.56	595	3.91
51	8.03	214	5.50	600	3.85
53	7.55	218	5.50	604	3.91
57	7.39	223	5.50	609	3.96
59	7.28	227	5.50	613	3.85
60	7.01	228	5.45	616	3.80
62	6.85	232	5.39	653	3.80
64	6.75	234	5.39	659	3.74
66	6.69	246	5.23	662	3.80
69	6.64	255	5.18	667	3.74
70	6.69	260	5.07	673	3.68
71	6.69	269	5.07	683	3.68
72	6.85	271	5.01	694	3.68
73	6.69	290	5.01	696	3.68
74	6.59	294	5.07	712	3.68
77	6.53	298	5.01	724	3.68
80	6.48	309	4.90	730	3.74
81	6.48	323	4.85	733	3.74
84	6.37	326	4.85	739	3.74
91	6.26	329	4.74	741	3.68
94	6.26	332	4.74	744	3.68
97	6.10	337	4.68	747	3.68
100	5.99	343	4.68	748	3.68
103	5.94	349	4.68		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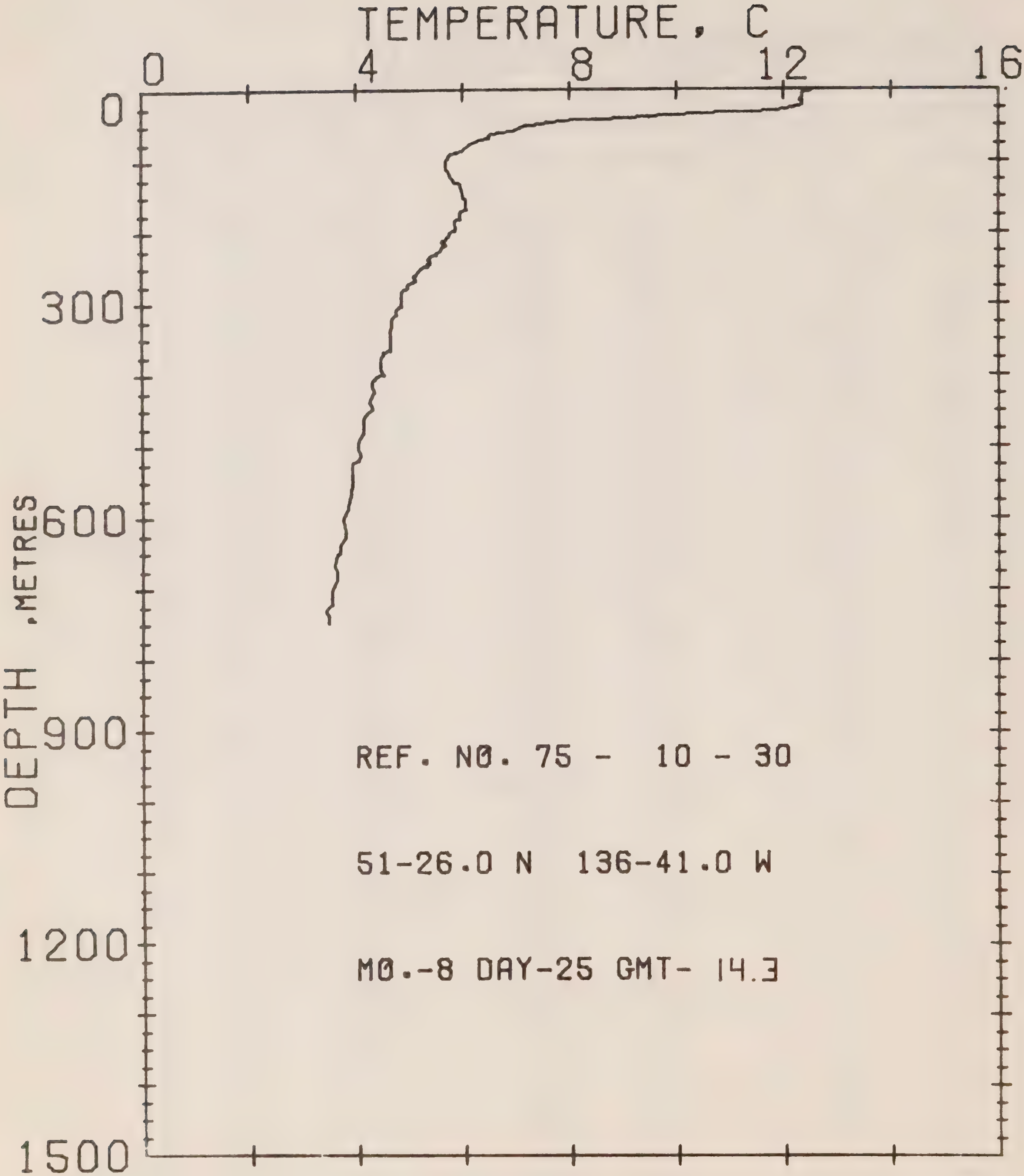
DEPTH ,METRES
REF. NO. 75 - 10 - 29
51-30.0 N 137-40.0 W
MO.-8 DAY-25 GMT- 10.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 29 DATE 25/ 8/75
POSITION 51-30.0N 137-40.0W GMT 10.3
RESULTS OF XBT CAST 134 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
3	12.55	159	6.32	356	4.90
10	12.60	166	6.32	357	4.85
17	12.60	171	6.37	368	4.85
21	12.60	180	6.21	382	4.79
22	12.45	186	6.15	386	4.74
26	12.29	190	6.15	410	4.68
27	12.19	191	6.10	415	4.57
29	11.73	196	6.10	421	4.63
33	10.59	197	5.99	431	4.63
36	10.28	199	5.88	441	4.57
38	9.71	201	5.77	447	4.52
40	8.96	203	5.83	452	4.46
41	8.34	206	5.83	460	4.46
44	7.97	207	5.77	463	4.41
46	7.76	212	5.67	473	4.41
49	7.39	216	5.67	478	4.41
50	7.39	220	5.61	481	4.35
52	7.26	223	5.56	515	4.24
57	7.01	226	5.61	521	4.13
61	6.64	232	5.50	525	4.07
67	6.48	234	5.50	529	4.13
69	6.42	237	5.45	535	4.18
71	6.32	240	5.39	544	4.24
74	6.26	242	5.34	573	4.24
78	6.15	244	5.28	600	4.18
80	6.05	249	5.18	612	4.13
84	6.05	257	5.18	620	4.13
88	5.88	259	5.12	626	4.13
92	5.83	261	5.07	635	4.13
95	5.72	264	5.07	641	4.13
96	5.72	268	5.07	649	4.07
103	5.67	275	4.96	663	4.02
108	5.61	278	5.07	671	4.02
113	5.72	282	5.07	677	4.02
117	5.94	291	5.07	688	4.02
120	6.05	301	5.07	699	3.96
123	6.21	307	5.07	707	4.02
127	6.26	315	4.96	715	3.91
130	6.26	317	5.07	724	3.91
134	6.32	324	5.07	732	3.91
138	6.32	326	5.01	739	3.85
140	6.32	334	4.96	744	3.85
143	6.42	336	4.96	747	3.85
149	6.42	339	4.96	748	3.85
154	6.37	346	4.85		


TEMPERATURE, C
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4
8
12
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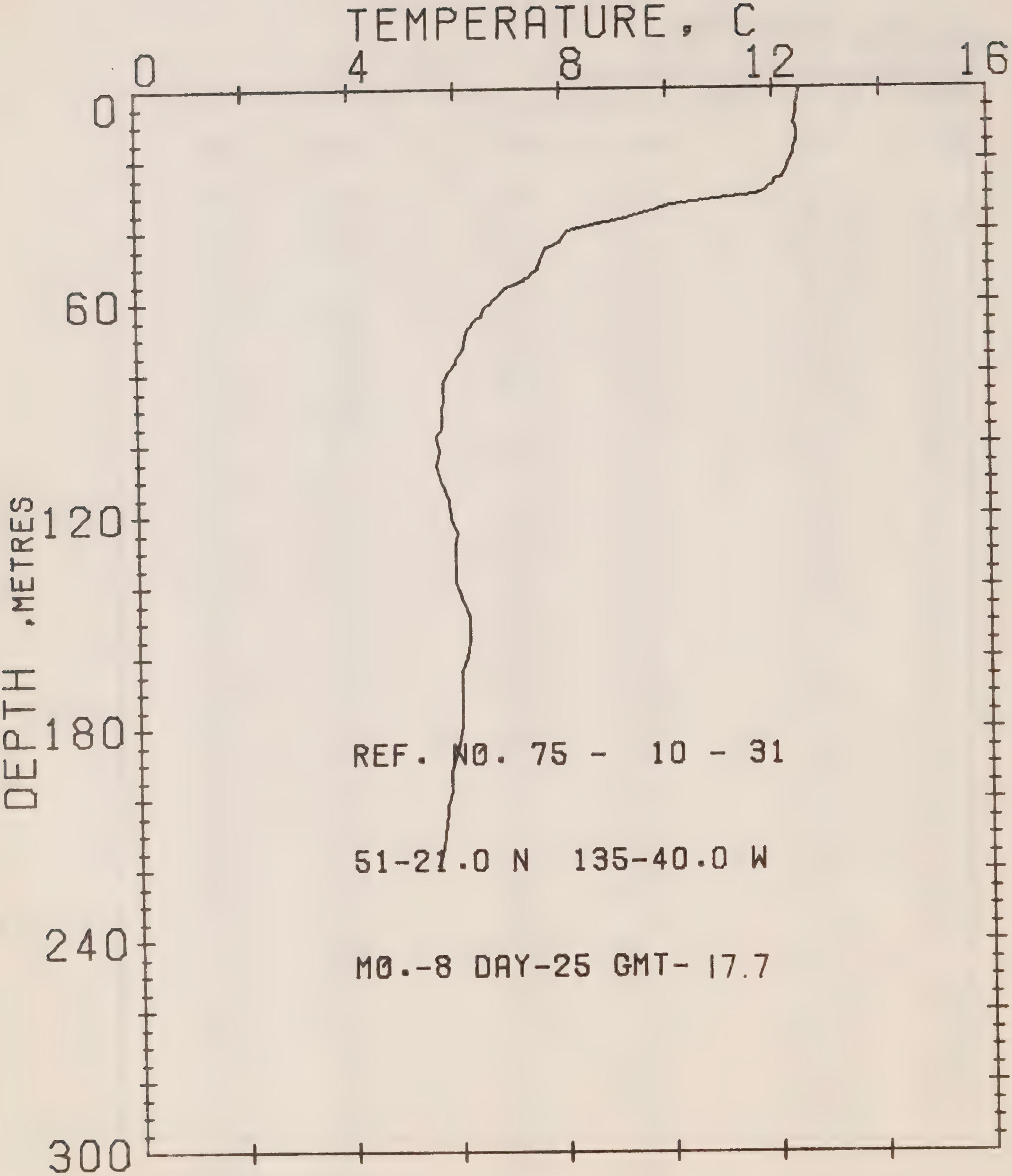
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 30
51-26.0 N 136-41.0 W
MO.-8 DAY-25 GMT- 14.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 30 DATE 25/ 8/75
POSITION 51-26.0N 136-41.0W GMT 14.3
RESULTS OF XBT CAST 139 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	12.50	180	5.94	392	4.46
6	12.34	183	5.94	401	4.52
12	12.34	185	5.83	403	4.41
15	12.29	196	5.88	407	4.35
17	12.34	198	5.83	410	4.30
21	12.34	200	5.77	419	4.30
25	12.19	203	5.72	423	4.35
28	12.04	206	5.72	430	4.30
30	11.83	207	5.72	437	4.24
32	11.37	210	5.67	447	4.30
33	10.95	214	5.61	457	4.18
35	9.86	219	5.67	461	4.13
38	9.45	223	5.61	466	4.13
41	8.61	226	5.56	481	4.13
43	8.13	230	5.50	488	4.07
45	7.87	232	5.50	494	4.02
47	7.65	235	5.39	504	4.02
49	7.44	237	5.34	511	4.07
50	7.34	240	5.39	515	4.07
51	7.18	243	5.39	520	4.02
53	7.07	245	5.34	523	3.91
57	6.96	248	5.34	529	3.91
60	6.69	251	5.23	554	3.91
64	6.48	259	5.12	585	3.85
68	6.48	261	5.07	596	3.80
69	6.42	268	5.12	603	3.74
73	6.26	270	5.07	620	3.80
78	6.10	274	4.96	628	3.80
85	5.99	278	4.96	637	3.68
88	5.88	283	4.85	641	3.68
92	5.77	292	4.85	644	3.68
94	5.72	304	4.85	649	3.68
97	5.72	306	4.79	651	3.63
99	5.67	310	4.74	667	3.57
105	5.67	316	4.74	678	3.63
113	5.67	321	4.68	686	3.63
116	5.72	326	4.68	696	3.57
122	5.77	330	4.68	703	3.52
129	5.83	341	4.63	713	3.52
130	5.83	353	4.63	722	3.52
131	5.94	364	4.63	730	3.41
134	5.94	366	4.63	734	3.41
152	5.99	369	4.52	739	3.46
154	6.05	373	4.52	741	3.46
167	6.05	377	4.46	746	3.46
168	6.05	382	4.46	748	3.46
172	5.94				


TEMPERATURE, C
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60
120
180
240
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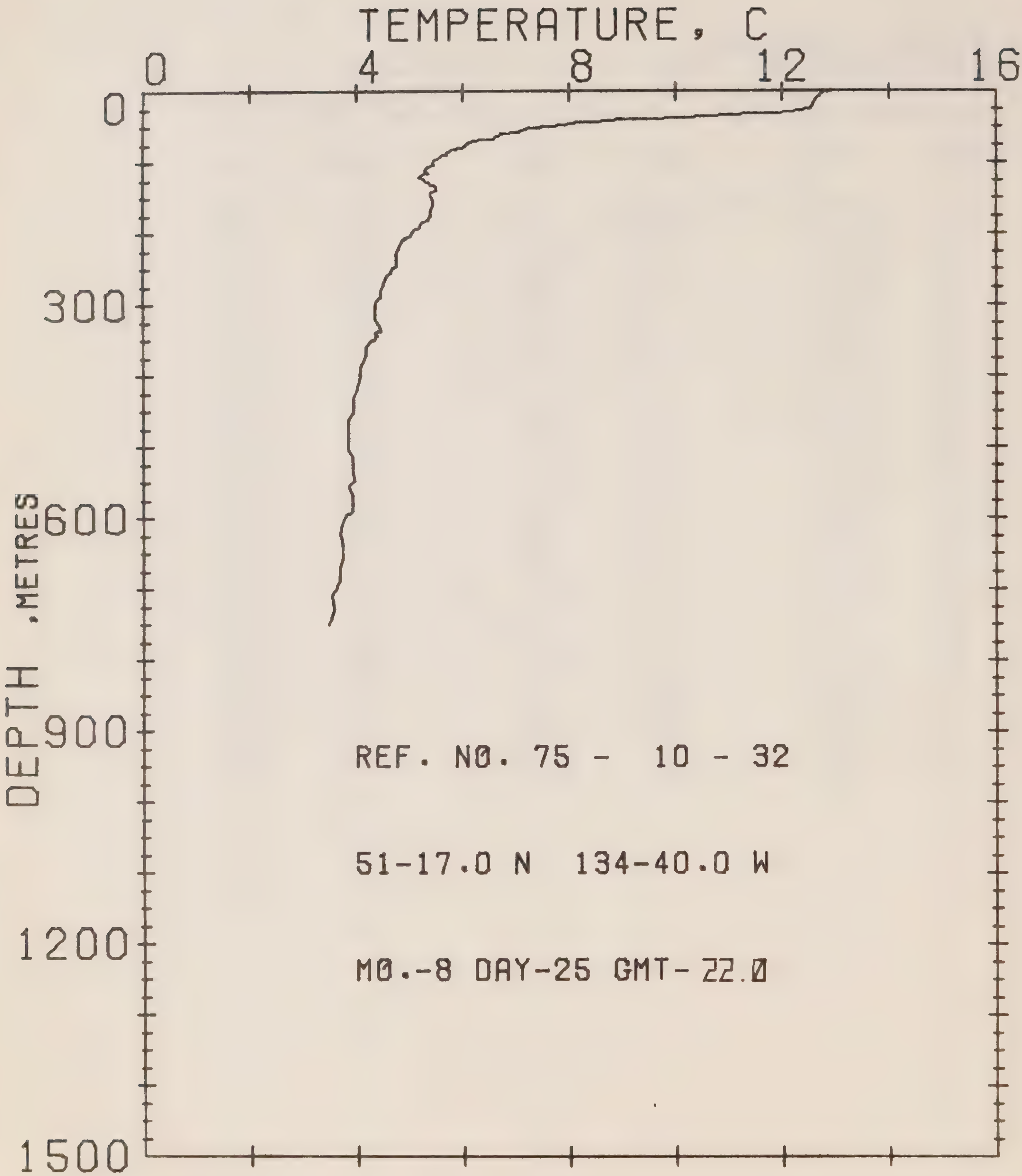
DEPTH ,METRES
REF. NO. 75 - 10 - 31
51-21.0 N 135-40.0 W
MO.-8 DAY-25 GMT- 17.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 31 DATE 25/ 8/75
POSITION 51-21.0N 135-40.0W GMT 17.7
RESULTS OF XBT CAST 74 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.50	54	7.28	121	5.86
5	12.45	55	7.18	125	5.99
7	12.45	56	6.96	128	5.94
10	12.40	57	6.91	134	5.94
12	12.45	60	6.69	139	5.94
15	12.45	62	6.53	143	6.05
17	12.40	64	6.48	147	6.15
19	12.40	65	6.37	149	6.21
20	12.34	68	6.21	152	6.21
22	12.29	71	6.15	155	6.21
25	12.19	73	6.15	160	6.15
26	12.04	74	6.10	164	6.05
27	12.04	76	5.99	168	6.05
29	11.88	77	5.99	174	6.05
30	11.68	80	5.83	179	6.05
31	11.11	83	5.77	187	5.94
33	10.07	88	5.77	192	5.83
34	9.81	90	5.72	198	5.83
37	9.03	95	5.72	202	5.77
38	8.71	98	5.61	204	5.77
40	8.13	102	5.67	207	5.72
43	7.97	106	5.61	214	5.67
45	7.71	110	5.67	218	5.61
47	7.65	113	5.77	219	5.56
51	7.55	116	5.83		


TEMPERATURE, C
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300
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900
1200
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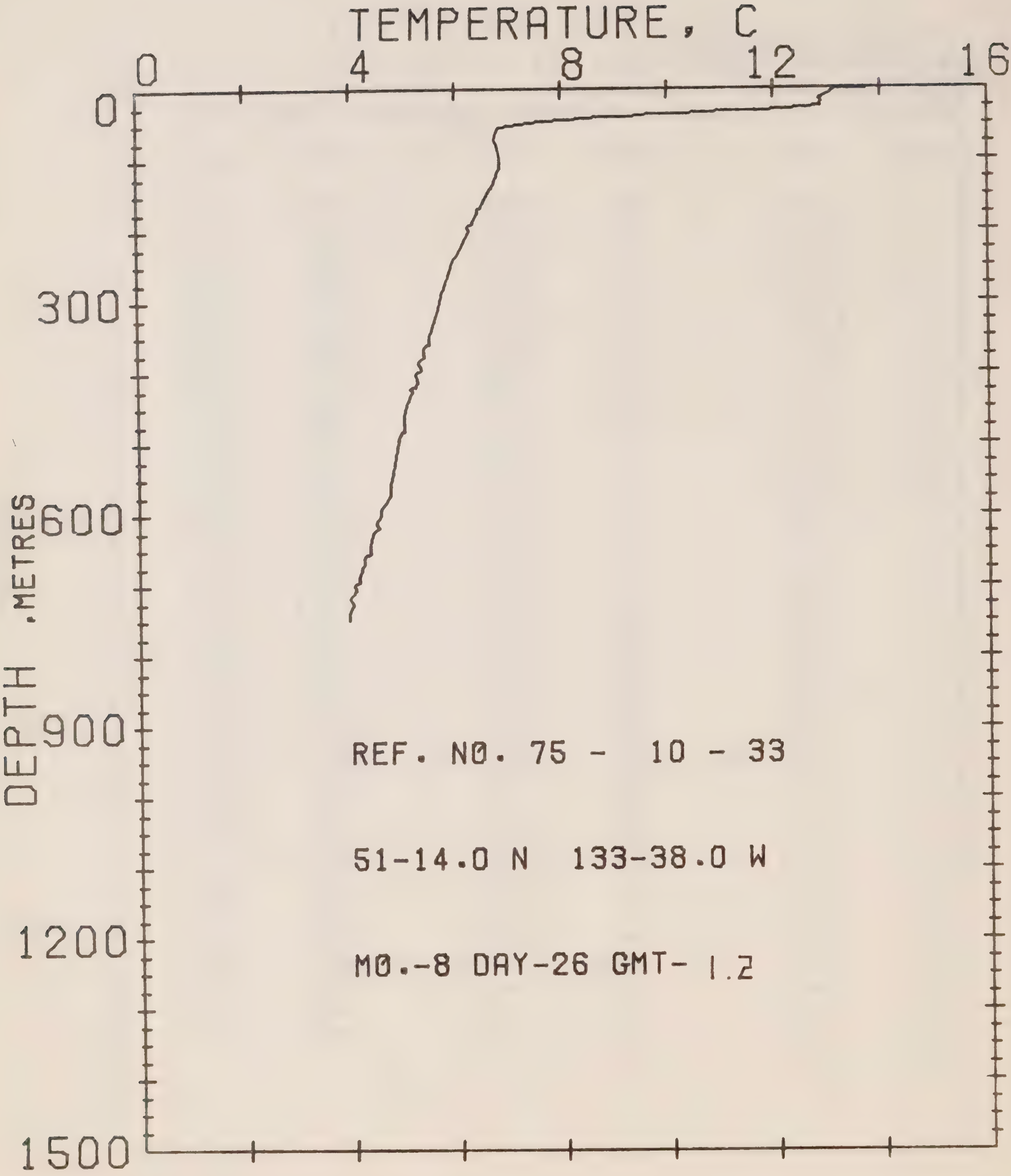
DEPTH .METRES
REF. NO. 75 - 10 - 32
51-17.0 N 134-40.0 W
MO.-8 DAY-25 GMT-22.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 32 DATE 25/ 8/75
POSITION 51-17.0N 134-40.0W GMT 22.0
RESULTS OF XBT CAST 110 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.91	105	5.45	333	4.46
3	12.75	108	5.34	337	4.46
9	12.70	112	5.28	340	4.35
13	12.60	116	5.34	343	4.41
22	12.55	119	5.23	349	4.35
26	12.50	122	5.18	351	4.30
28	12.34	125	5.28	359	4.18
31	12.14	131	5.39	372	4.18
32	11.88	135	5.50	387	4.07
33	11.47	140	5.50	400	4.07
34	11.01	143	5.39	419	4.02
37	10.13	148	5.39	429	3.96
39	9.45	154	5.45	452	3.96
40	8.98	159	5.45	461	3.85
41	8.77	167	5.39	479	3.85
44	8.45	177	5.39	496	3.85
45	8.19	182	5.34	505	3.85
47	8.08	186	5.23	514	3.91
48	7.87	192	5.18	522	3.91
51	7.71	198	5.07	534	3.91
52	7.28	204	5.01	548	3.96
54	7.18	208	4.90	556	3.85
58	7.07	212	4.85	567	3.91
59	6.75	221	4.79	590	3.91
60	6.75	228	4.74	598	3.80
62	6.69	239	4.74	608	3.74
67	6.59	246	4.74	622	3.68
69	6.32	250	4.68	639	3.74
72	6.15	255	4.63	659	3.74
74	6.10	261	4.57	670	3.68
78	6.05	272	4.52	688	3.68
81	5.86	282	4.46	697	3.63
84	5.77	290	4.46	710	3.52
88	5.67	293	4.41	729	3.57
90	5.67	300	4.35	742	3.52
93	5.56	323	4.35	749	3.46
100	5.45	329	4.41		


TEMPERATURE, C
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1200
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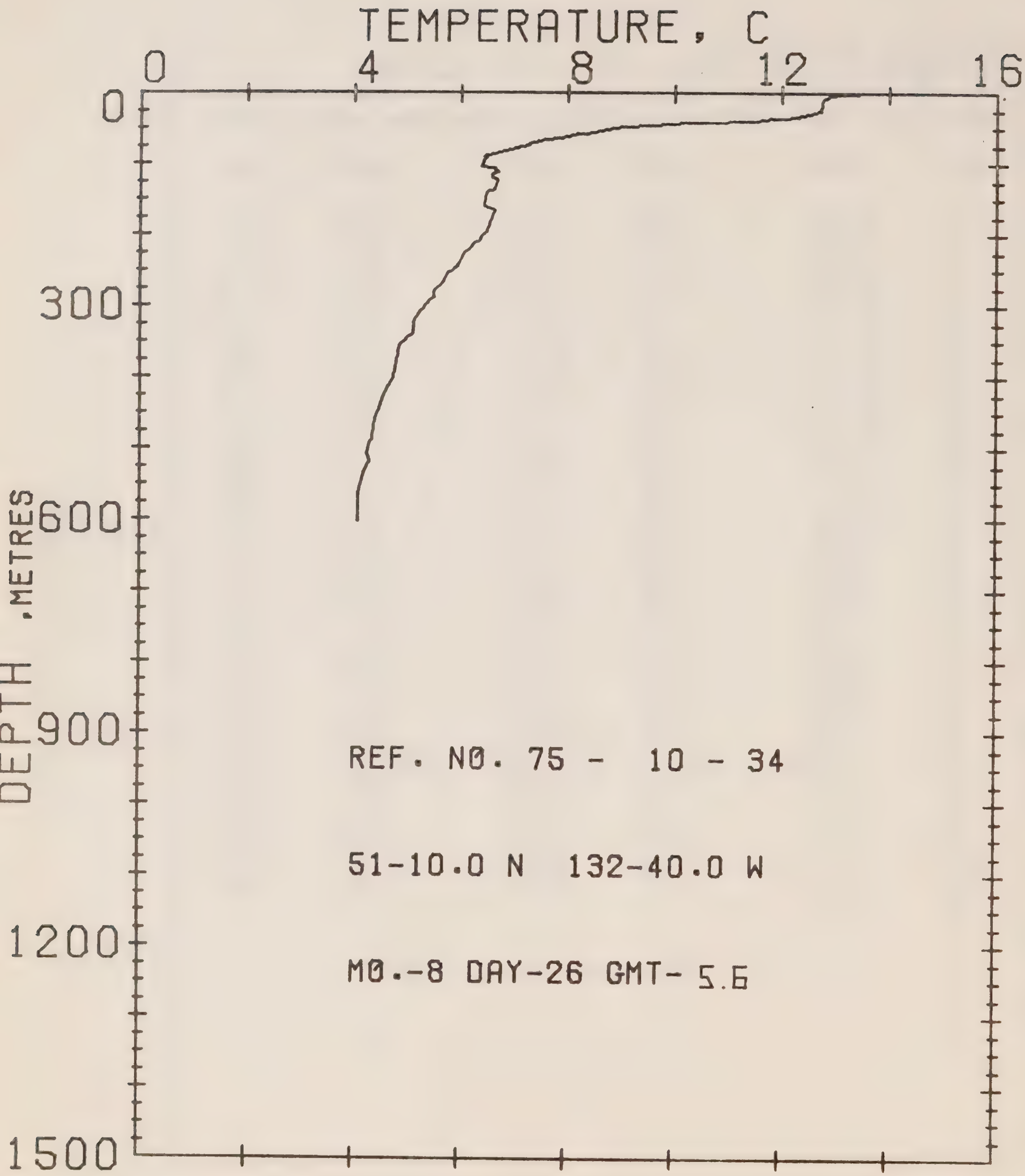
DEPTH .METRES
REF. NO. 75 - 10 - 33
51-14.0 N 133-38.0 W
MO.-8 DAY-26 GMT- 1.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 33 DATE 26/ 8/75
POSITION 51-14.0N 133-38.0W GMT 1.2
RESULTS OF XBT CAST 88 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.72	139	6.69	446	5.07
2	13.21	147	6.64	460	5.01
5	13.11	159	6.53	470	5.01
9	13.06	167	6.48	482	5.01
14	12.91	168	6.42	484	4.96
15	12.86	175	6.42	495	4.90
20	12.91	190	6.32	517	4.85
26	12.86	195	6.21	540	4.79
29	12.55	201	6.26	559	4.74
30	12.24	215	6.15	571	4.74
32	11.62	232	6.05	581	4.68
33	11.16	245	5.94	592	4.57
34	10.70	264	5.88	601	4.57
35	10.18	291	5.72	613	4.46
36	9.71	309	5.67	619	4.52
37	9.50	329	5.61	627	4.41
39	9.29	334	5.56	641	4.35
40	8.82	351	5.50	654	4.35
41	8.45	360	5.50	660	4.24
44	8.13	363	5.45	669	4.24
46	7.65	367	5.39	678	4.18
50	7.23	379	5.39	687	4.13
54	6.85	386	5.28	695	4.13
61	6.80	396	5.34	701	4.02
72	6.75	403	5.23	707	4.07
83	6.80	415	5.28	717	3.96
98	6.85	420	5.23	727	4.02
113	6.85	422	5.12	739	3.96
122	6.80	427	5.18	747	3.96
131	6.75				



TEMPERATURE, C
0
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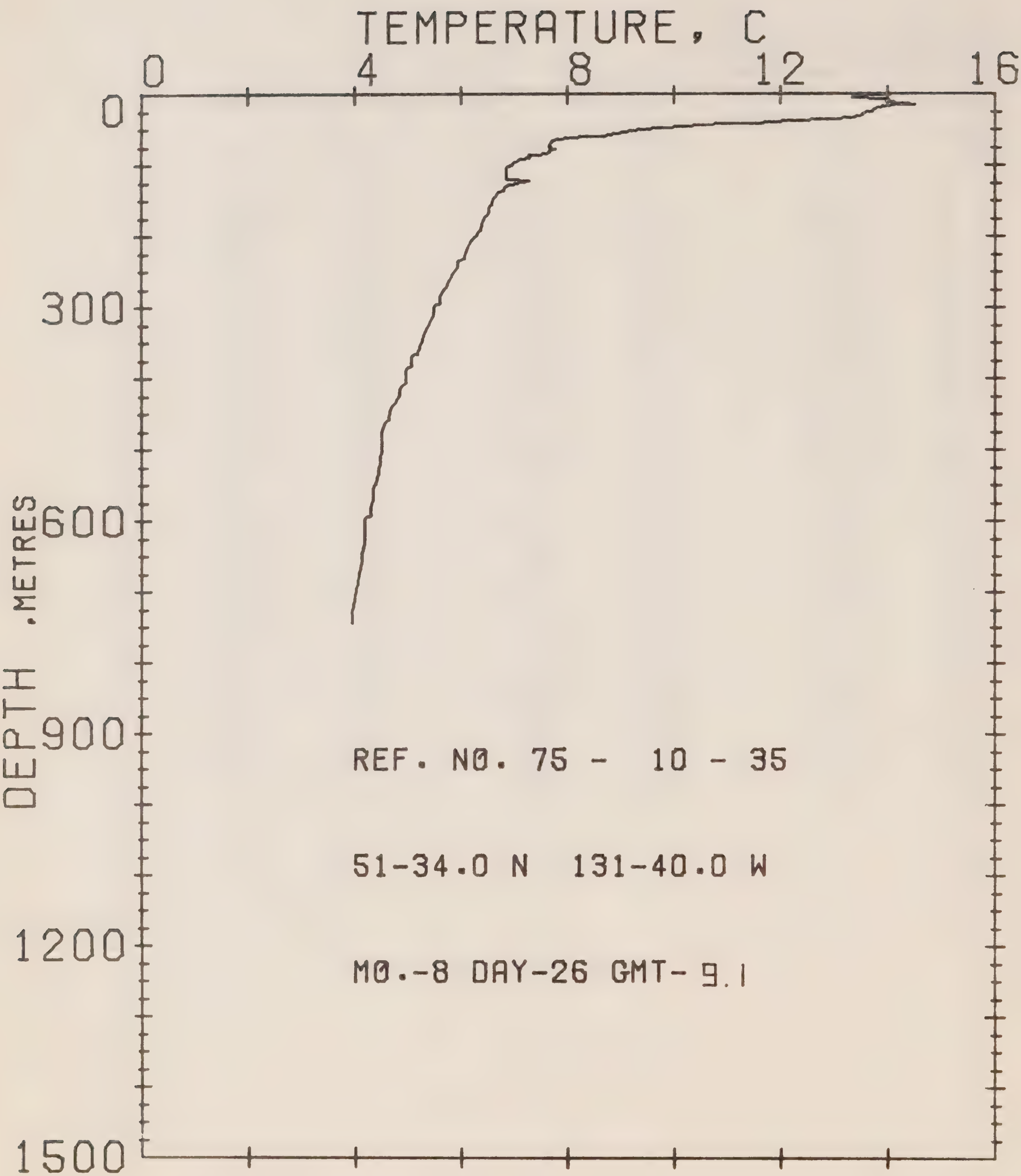
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 34
51-10.0 N 132-40.0 W
MO.-8 DAY-26 GMT- 5.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 34 DATE 26/ 8/75
POSITION 51-10.0N 132-40.0W GMT 5.6
RESULTS OF XBT CAST 77 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.42	96	6.42	309	5.23
2	13.06	103	6.37	321	5.12
6	12.86	104	6.42	338	5.12
11	12.75	106	6.48	348	4.96
18	12.75	107	6.64	355	4.85
27	12.70	109	6.64	379	4.79
34	12.29	111	6.64	401	4.74
35	12.04	112	6.69	412	4.68
36	11.83	116	6.59	415	4.63
39	11.52	121	6.59	425	4.57
40	11.26	123	6.69	438	4.52
41	10.75	136	6.64	460	4.41
43	10.23	140	6.48	482	4.35
46	9.60	160	6.42	487	4.35
49	9.03	165	6.64	492	4.30
54	8.61	195	6.48	508	4.24
57	8.34	203	6.37	520	4.30
58	8.19	207	6.37	526	4.24
62	8.03	216	6.21	534	4.18
63	7.87	229	6.05	549	4.13
66	7.60	243	5.94	565	4.07
71	7.28	253	5.77	570	4.07
74	7.28	266	5.67	581	4.07
77	7.07	280	5.50	597	4.07
90	6.42	287	5.50	602	4.07
93	6.46	296	5.39		


TEMPERATURE, C
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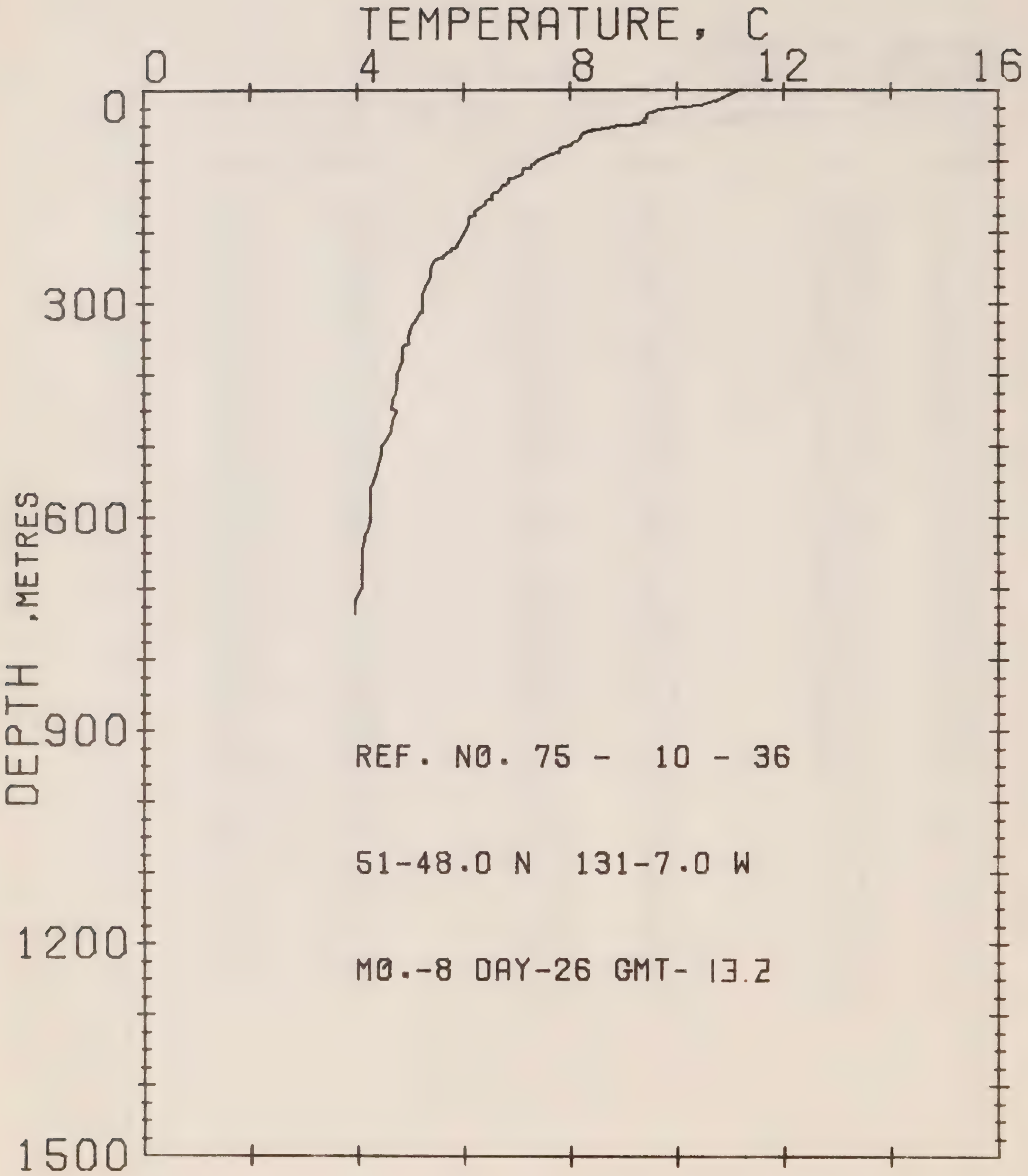
8
12
16
0
300
600
900
1200
1500
DEPTH .METRES
REF. NO. 75 - 10 - 35
51-34.0 N 131-40.0 W
MO.-8 DAY-26 GMT- 9.1

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 35 DATE 26/ 8/75
POSITION 51-34.0N 131-40.0W GMT 9.1
RESULTS OF XBT CAST 101 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.03	80	7.65	356	5.23
2	13.67	83	7.65	365	5.18
3	13.37	86	7.50	368	5.07
6	13.32	87	7.28	379	5.07
7	13.88	89	7.28	382	5.07
9	13.98	94	7.07	387	4.96
10	14.03	99	6.96	393	4.96
11	13.98	101	6.91	406	4.96
13	14.28	103	6.85	415	4.85
14	14.28	120	6.85	423	4.85
15	14.49	122	7.28	443	4.68
17	14.18	125	7.07	458	4.63
19	13.93	129	6.85	464	4.57
22	13.77	136	6.80	477	4.52
25	13.72	139	6.69	498	4.52
27	13.62	151	6.59	529	4.46
30	13.52	156	6.59	534	4.46
34	13.37	160	6.53	547	4.41
36	12.91	165	6.53	554	4.35
37	12.19	178	6.42	557	4.35
40	11.83	192	6.37	571	4.35
41	11.52	207	6.21	582	4.30
43	10.90	220	6.10	591	4.30
46	10.18	231	6.05	597	4.18
50	9.39	236	5.94	601	4.18
55	9.03	243	5.94	607	4.18
59	8.66	253	5.83	633	4.18
60	8.34	268	5.77	646	4.13
62	8.08	284	5.61	657	4.13
65	7.81	295	5.61	676	4.07
68	7.71	300	5.50	697	4.02
74	7.65	312	5.50	730	3.96
77	7.71	334	5.34	744	3.96
78	7.76	346	5.28		


TEMPERATURE, C
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300
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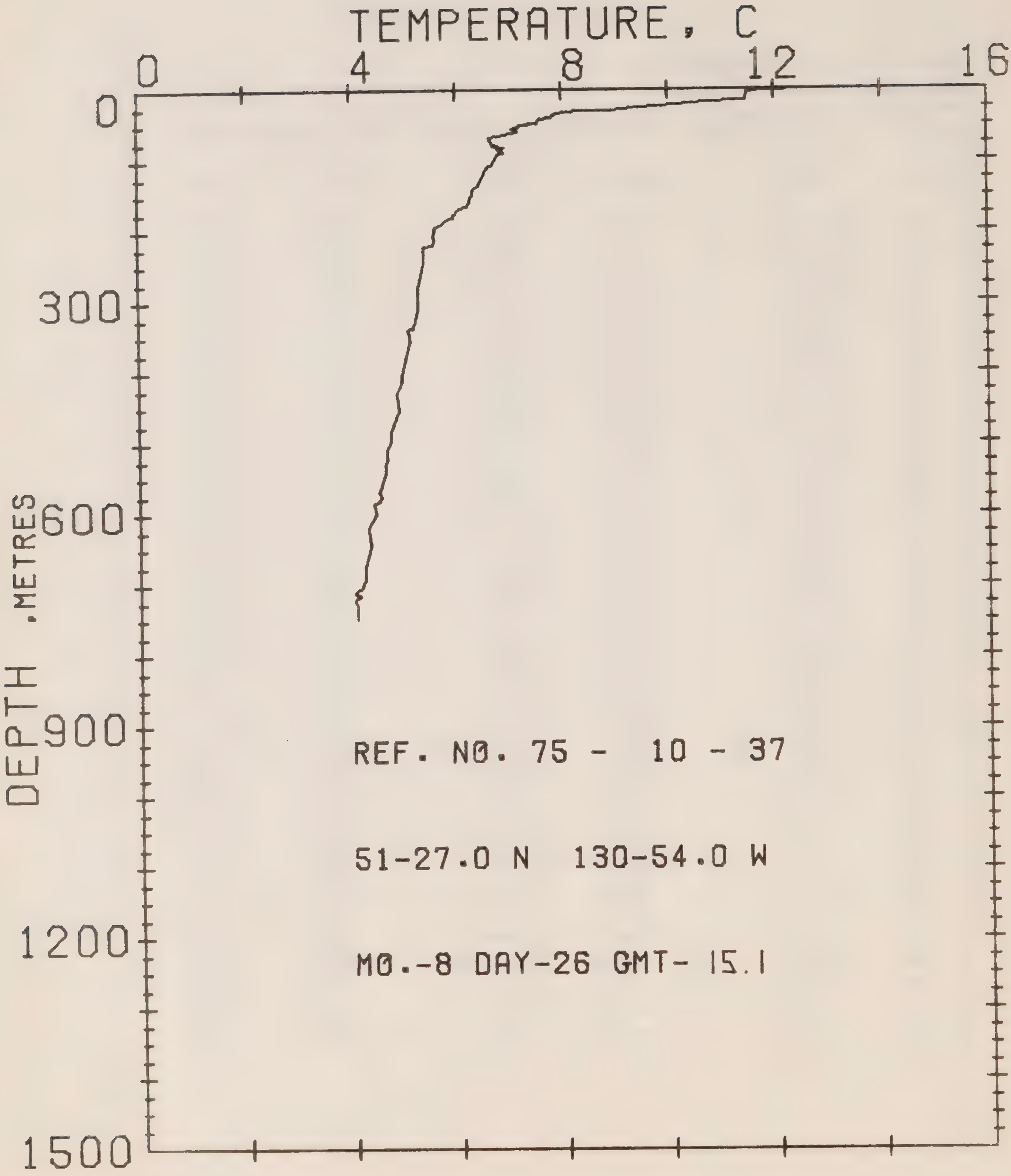
900
1200
1500
DEPTH .METRES
REF. NO. 75 - 10 - 36
51-48.0 N 131-7.0 W
MO.-8 DAY-26 GMT- 13.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 36 DATE 26/ 8/75
POSITION 51-48.0N 131- 7.0W GMT 13.2
RESULTS OF XBT CAST 106 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.11	103	7.34	293	5.23
2	11.11	105	7.28	301	5.23
3	11.06	109	7.28	308	5.23
6	11.01	110	7.12	312	5.23
8	10.95	119	7.12	314	5.18
12	10.85	123	6.96	323	5.12
16	10.75	124	6.85	335	5.01
19	10.59	130	6.85	348	4.96
22	10.44	134	6.80	356	4.96
24	10.13	135	6.75	362	4.85
26	9.81	140	6.69	380	4.85
28	9.76	144	6.64	400	4.74
29	9.71	146	6.53	420	4.74
30	9.60	153	6.53	435	4.68
33	9.55	157	6.42	448	4.63
34	9.45	161	6.42	452	4.74
39	9.45	167	6.26	462	4.68
42	9.39	171	6.21	478	4.63
43	9.39	175	6.21	490	4.57
46	9.39	179	6.10	500	4.46
48	9.29	182	6.10	510	4.46
50	9.03	188	6.10	526	4.41
51	8.92	196	6.05	540	4.35
52	8.82	204	5.99	560	4.24
53	8.71	220	5.88	578	4.24
56	8.45	226	5.77	607	4.24
58	8.40	230	5.67	621	4.18
59	8.29	233	5.61	625	4.13
62	8.24	236	5.61	632	4.13
69	8.19	239	5.50	646	4.07
77	8.03	242	5.45	666	4.07
83	7.81	251	5.39	686	4.07
88	7.81	261	5.39	699	4.07
90	7.65	278	5.28	718	3.96
95	7.50	289	5.23	736	3.96
99	7.39				


TEMPERATURE, C
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16
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300
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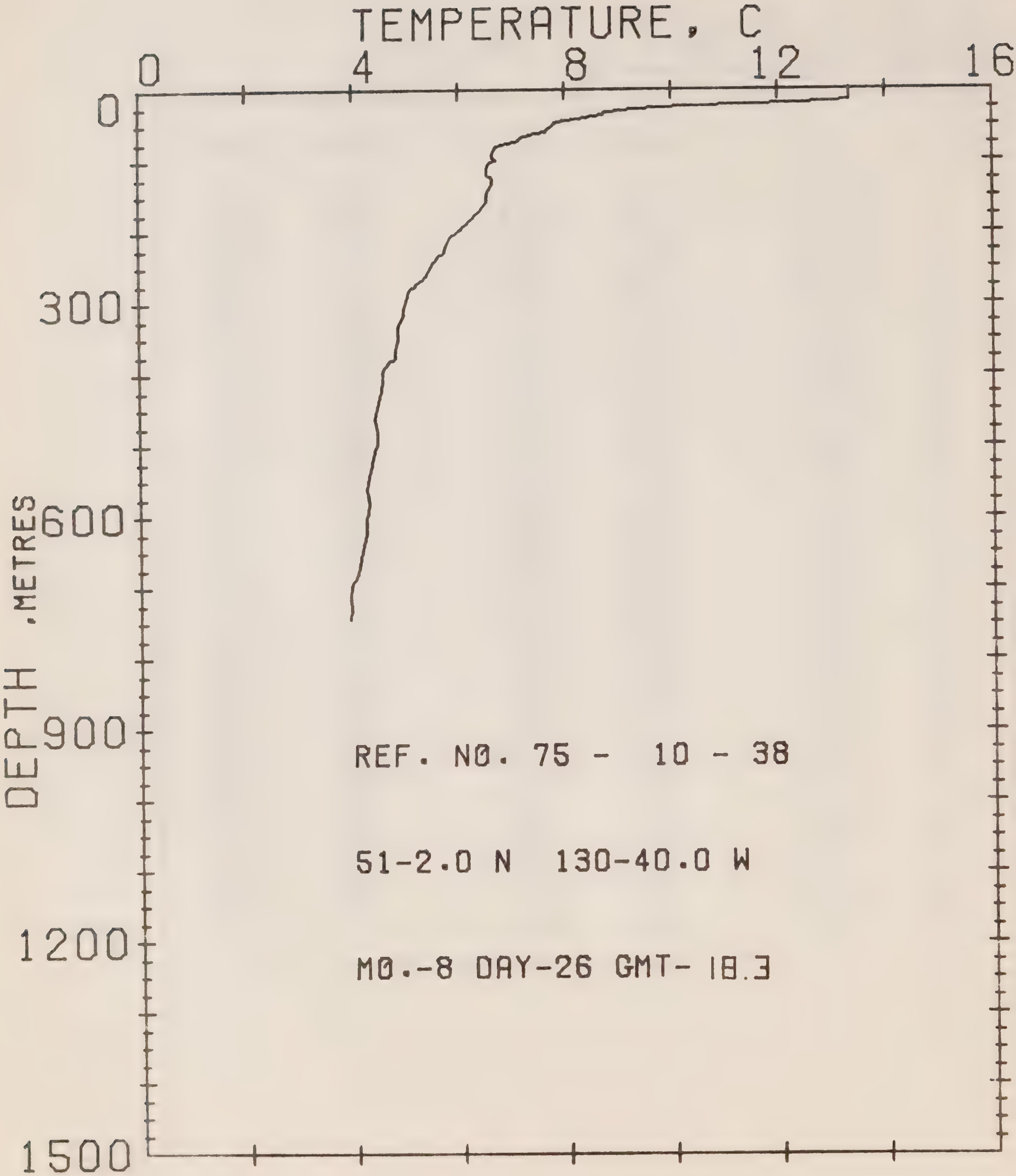
900
1200
1500
DEPTH .METRES
REF. N0. 75 - 10 - 37
51-27.0 N 130-54.0 W
M0.-8 DAY-26 GMT- 15.1

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 57 DATE 26/ 8/75
POSITION 51-27.0N 130-54.0W GMT 15.1
RESULTS OF XBT CAST 95 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.19	99	6.75	358	5.12
2	11.83	107	6.69	372	5.07
4	11.52	113	6.59	389	5.01
16	11.47	121	6.53	404	4.96
17	11.37	129	6.48	414	4.96
18	10.75	136	6.42	430	4.85
20	10.44	144	6.32	454	4.90
21	10.13	150	6.32	473	4.79
24	9.86	157	6.26	483	4.74
26	9.45	161	6.26	496	4.74
28	9.13	165	6.21	510	4.68
30	8.98	167	6.10	522	4.68
31	8.45	170	6.05	529	4.63
33	8.03	175	5.99	542	4.63
35	7.87	178	5.94	560	4.57
39	7.81	181	5.94	568	4.52
42	7.60	185	5.83	576	4.57
48	7.55	190	5.77	581	4.52
50	7.23	196	5.61	586	4.41
53	7.18	200	5.61	600	4.46
56	7.07	204	5.56	621	4.30
59	7.13	210	5.56	644	4.35
63	6.96	213	5.61	660	4.30
67	6.64	220	5.56	673	4.24
73	6.64	223	5.39	692	4.24
77	6.69	243	5.39	702	4.18
78	6.75	282	5.28	712	4.02
80	6.69	310	5.28	716	4.13
82	6.91	327	5.23	722	4.02
84	6.80	338	5.18	733	4.07
89	6.91	340	5.07	747	4.07
92	6.80	349	5.12		


TEMPERATURE, C
0
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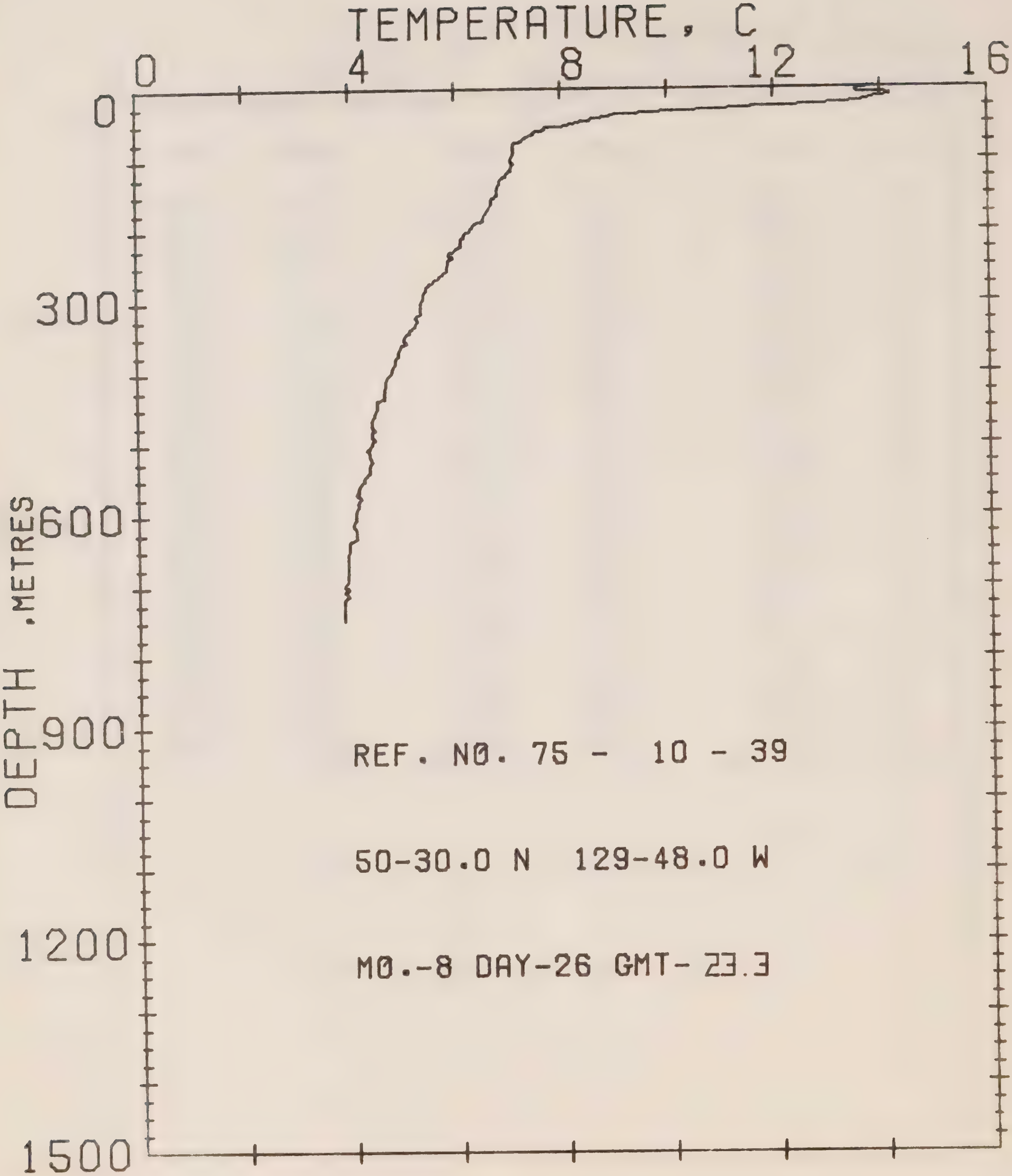
DEPTH ,METRES
REF. NO. 75 - 10 - 38
51-2.0 N 130-40.0 W
MO.-8 DAY-26 GMT- 18.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 38 DATE 26/ 8/75
POSITION 51- 2.0N 130-40.0W GMT 18.3
RESULTS OF XBT CAST 73 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.32	120	6.53	366	4.79
10	13.32	126	6.64	375	4.79
16	13.32	131	6.64	384	4.68
19	13.01	139	6.59	397	4.57
21	11.47	146	6.53	409	4.57
24	10.28	153	6.53	431	4.52
29	9.34	158	6.53	462	4.41
32	8.77	168	6.42	482	4.46
36	8.71	180	6.26	498	4.46
40	8.40	187	6.15	508	4.41
42	8.29	197	6.05	526	4.35
45	7.97	206	5.88	542	4.30
49	7.81	220	5.77	561	4.24
61	7.65	228	5.72	582	4.30
64	7.34	236	5.61	604	4.24
67	7.18	248	5.50	619	4.24
72	7.12	261	5.39	622	4.24
75	6.96	275	5.18	637	4.18
78	6.80	281	5.07	659	4.13
82	6.69	296	5.01	679	4.07
89	6.64	308	4.96	696	3.96
96	6.64	316	4.96	714	3.91
99	6.69	331	4.85	730	3.96
104	6.59	352	4.85	744	3.91
110	6.53				


TEMPERATURE, C
0
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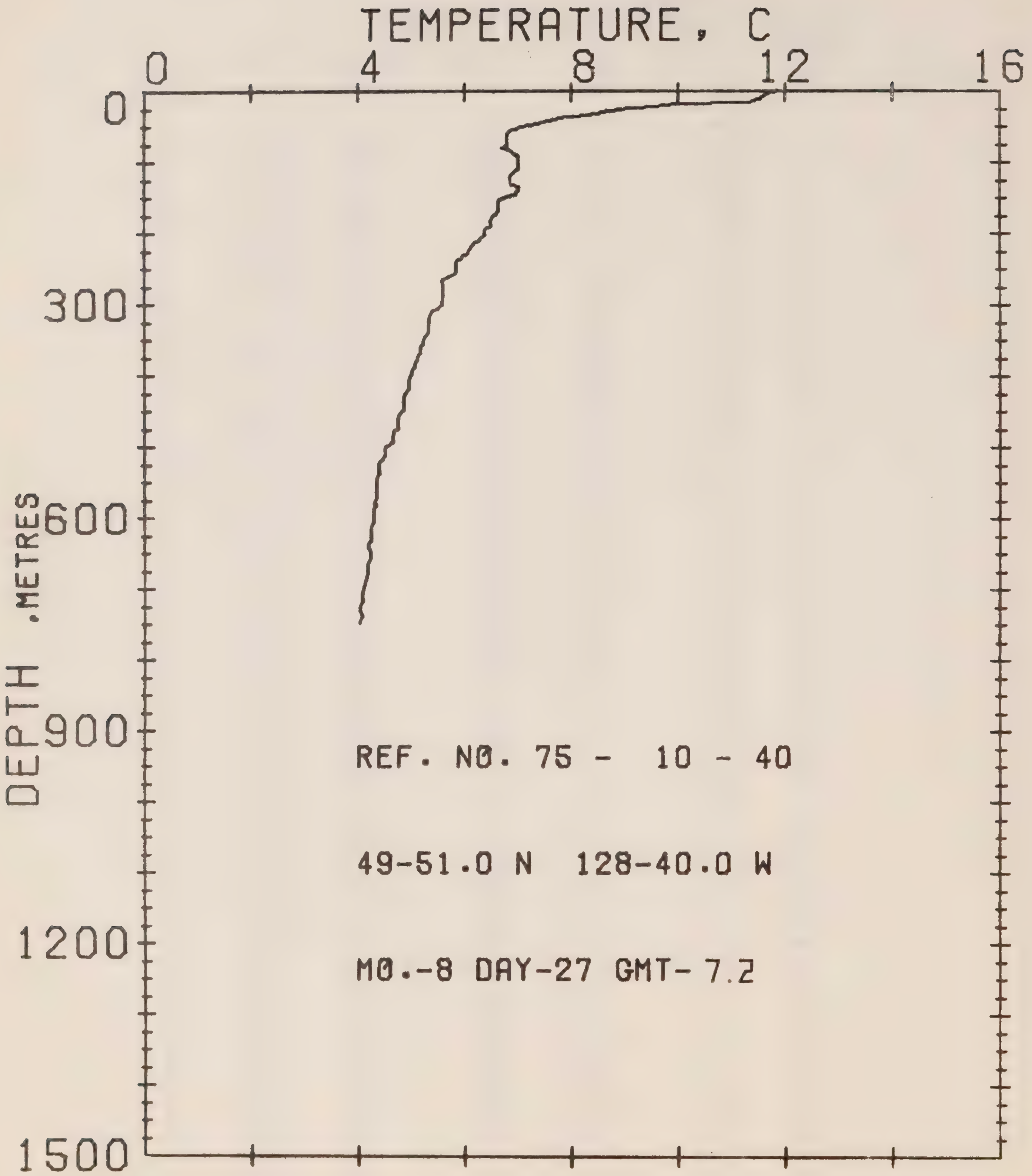
DEPTH .METRES
REF. NO. 75 - 10 - 39
50-30.0 N 129-48.0 W
MO.-8 DAY-26 GMT- 23.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 39 DATE 26/ 8/75
POSITION 50-30.0N 129-48.0W GMT 23.3
RESULTS OF XBT CAST 198 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.88	139	6.80	443	4.52
2	13.62	145	6.80	447	4.52
6	13.52	150	6.80	451	4.52
7	13.57	154	6.75	457	4.46
8	13.72	157	6.69	460	4.46
9	13.98	163	6.69	466	4.41
10	14.18	171	6.64	470	4.41
12	14.18	177	6.59	473	4.41
13	14.03	182	6.53	477	4.41
14	13.93	186	6.53	480	4.46
16	13.83	188	6.48	483	4.41
18	13.77	191	6.37	486	4.41
19	13.72	196	6.32	490	4.41
20	13.62	201	6.26	493	4.46
21	13.26	205	6.15	497	4.41
22	13.11	207	6.15	500	4.41
23	12.91	209	6.15	505	4.35
24	12.60	212	6.10	508	4.30
25	12.29	215	6.10	512	4.35
26	11.78	221	6.10	516	4.35
27	11.62	224	6.05	518	4.35
28	11.57	226	5.99	524	4.41
29	11.37	233	5.88	530	4.35
30	10.95	239	5.94	535	4.35
31	10.64	242	5.88	540	4.35
32	10.44	246	5.88	543	4.30
33	10.07	251	5.83	548	4.24
34	9.71	255	5.83	550	4.24
35	9.24	259	5.77	552	4.24
36	9.03	261	5.77	556	4.18
39	8.92	264	5.67	561	4.13
40	8.82	266	5.67	568	4.13
42	8.77	271	5.56	571	4.07
43	8.61	275	5.50	577	4.18
46	8.55	280	5.45	581	4.13
47	8.40	283	5.45	584	4.13
50	8.24	287	5.39	589	4.13
52	8.13	297	5.39	595	4.07
53	8.03	302	5.34	601	4.07
54	7.76	308	5.34	605	4.07
56	7.71	316	5.34	612	4.02
58	7.71	321	5.23	616	4.02
59	7.65	325	5.28	621	4.07
60	7.60	328	5.28	624	4.07
62	7.50	333	5.23	631	4.07
65	7.50	337	5.18	639	3.96
66	7.44	340	5.12	647	3.96
70	7.34	343	5.12	656	3.91
74	7.28	347	5.07	663	3.91
75	7.23	352	5.01	671	3.91
76	7.18	354	5.01	677	3.91
78	7.12	358	5.07	687	3.91
64	7.12	360	5.01	692	3.91
88	7.12	363	4.96	700	3.85
93	7.12	371	4.90	704	3.91
99	7.07	375	4.90	708	3.85
101	7.07	380	4.85	709	3.85
104	7.07	388	4.85	714	3.91
107	7.12	393	4.79	720	3.85
112	7.07	396	4.79	724	3.85
116	7.07	410	4.68	732	3.85
118	7.01	416	4.68	737	3.85
123	6.96	423	4.63	739	3.85
127	6.91	431	4.63	744	3.85
129	6.85	435	4.63	747	3.85
135	6.85	439	4.52	748	3.85


TEMPERATURE, C
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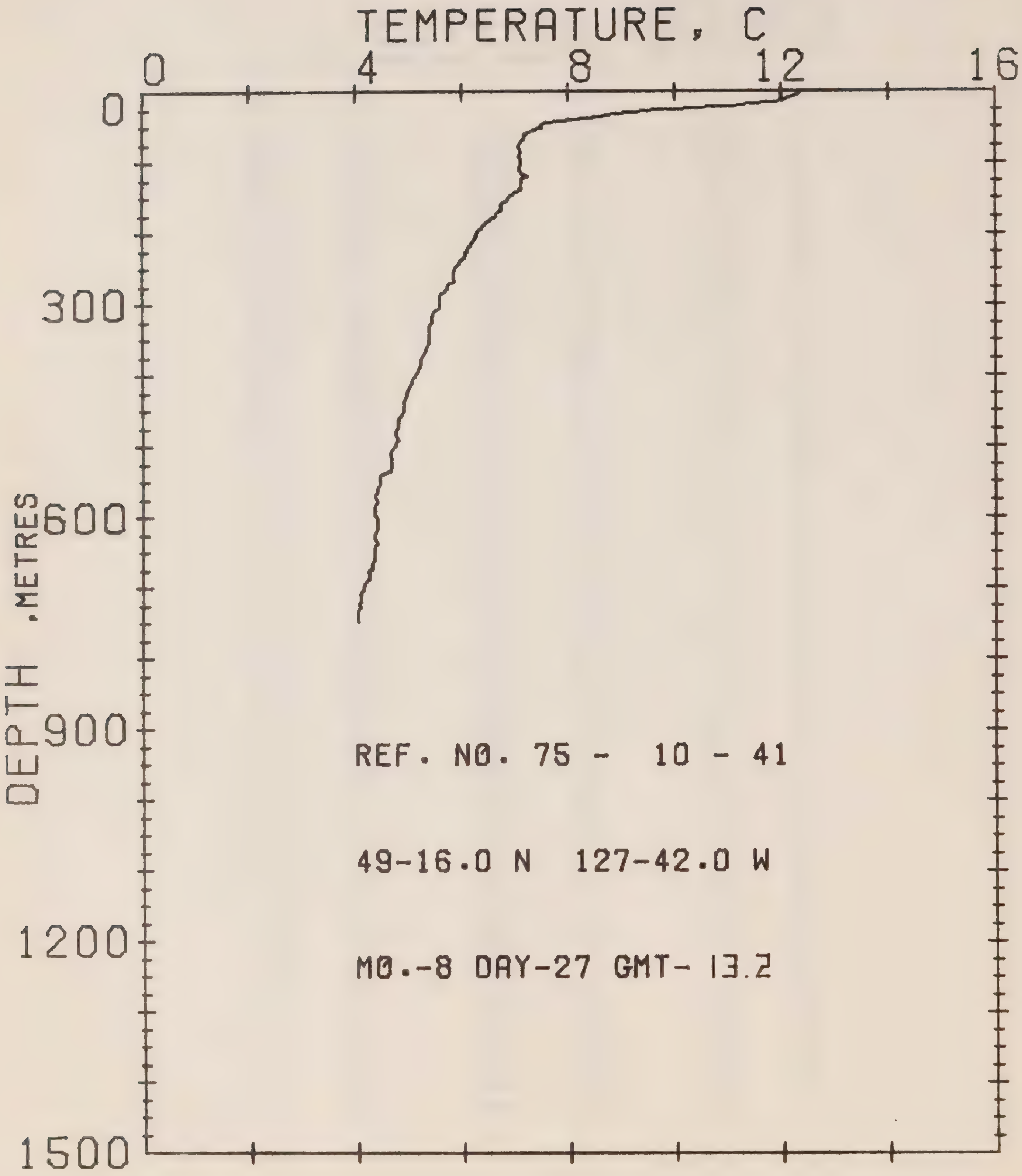
DEPTH ,METRES
REF. NO. 75 - 10 - 40
49-51.0 N 128-40.0 W
MO.-8 DAY-27 GMT- 7.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 40 DATE 27/ 8/75
POSITION 49-51.0N 128-40.0W GMT 7.2
RESULTS OF XBT CAST 168 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.83	139	7.01	419	4.96
3	11.68	142	6.96	423	4.90
6	11.62	145	6.96	429	4.85
8	11.57	147	6.91	438	4.85
11	11.52	149	6.85	447	4.85
13	11.42	150	6.75	453	4.79
15	11.32	152	6.69	458	4.74
16	11.11	155	6.64	463	4.74
17	10.80	158	6.64	468	4.74
18	10.49	163	6.64	473	4.74
19	9.97	166	6.64	478	4.68
20	9.76	169	6.64	482	4.68
21	9.55	173	6.59	485	4.63
22	9.50	177	6.53	492	4.68
23	9.29	182	6.48	500	4.52
24	9.08	189	6.48	506	4.52
26	8.92	196	6.37	511	4.52
28	8.71	202	6.37	517	4.46
30	8.61	209	6.26	522	4.41
32	8.50	216	6.15	527	4.41
33	8.45	222	6.10	529	4.41
34	8.34	227	6.05	533	4.41
35	8.03	234	5.94	538	4.41
36	7.92	241	5.83	544	4.35
38	7.81	247	5.83	550	4.35
40	7.71	257	5.83	555	4.35
43	7.60	261	5.67	563	4.35
45	7.50	263	5.67	571	4.35
46	7.39	266	5.56	579	4.30
49	7.23	271	5.61	582	4.35
51	7.07	274	5.61	586	4.30
54	6.96	278	5.61	593	4.30
56	6.85	283	5.61	600	4.30
59	6.80	287	5.61	606	4.30
67	6.80	293	5.61	613	4.24
72	6.80	296	5.56	619	4.24
74	6.80	301	5.56	624	4.24
77	6.80	306	5.50	631	4.24
80	6.69	310	5.39	635	4.18
82	6.80	319	5.34	639	4.18
84	6.85	329	5.34	641	4.18
88	6.91	339	5.34	647	4.24
90	6.96	350	5.23	650	4.24
93	7.01	355	5.23	656	4.24
97	7.01	359	5.18	665	4.18
99	7.01	362	5.18	669	4.18
102	7.01	364	5.18	676	4.18
104	7.01	368	5.18	692	4.13
107	7.01	373	5.12	705	4.07
109	7.01	377	5.12	714	4.07
112	6.96	384	5.07	718	4.07
116	6.91	389	5.07	723	4.02
121	6.85	394	5.01	730	4.02
124	6.85	398	5.01	739	4.07
132	6.85	404	4.96	746	4.02
135	7.01	411	4.96	747	4.02


TEMPERATURE, C
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1200
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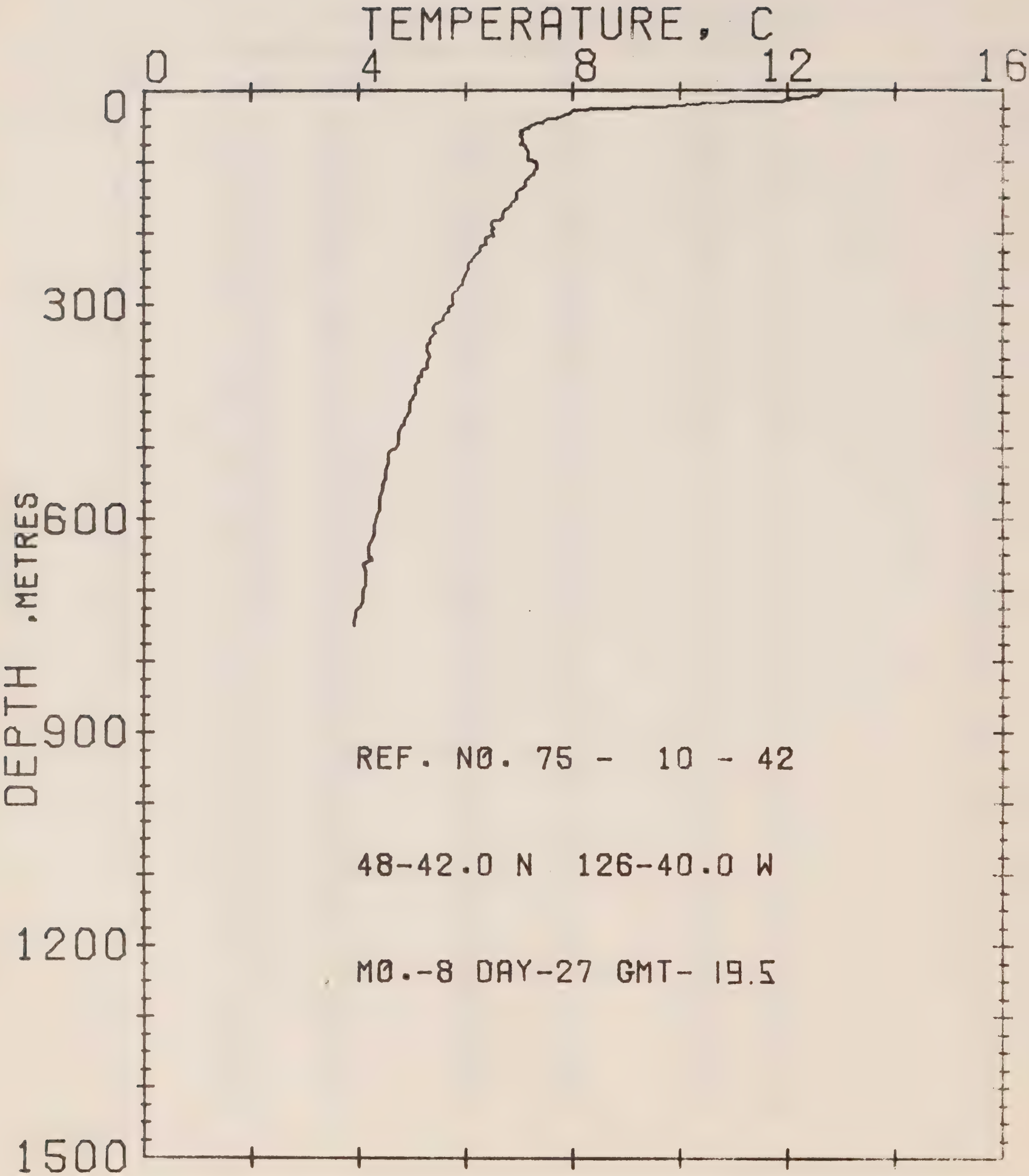
DEPTH .METRES
REF. NO. 75 - 10 - 41
49-16.0 N 127-42.0 W
MO.-8 DAY-27 GMT- 13.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 41 DATE 27/ 8/75
POSITION 49-16.0N 127-42.0W GMT 13.2
RESULTS OF XBT CAST 168 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.34	193	6.37	492	4.79
3	12.29	197	6.32	496	4.74
6	12.29	202	6.26	501	4.74
11	12.09	207	6.26	506	4.68
14	12.04	213	6.21	513	4.63
17	11.83	218	6.15	518	4.68
19	11.42	222	6.10	524	4.68
21	11.06	226	6.10	529	4.68
22	10.70	229	6.05	531	4.68
23	10.44	231	6.05	535	4.63
25	9.92	234	6.05	538	4.57
26	9.71	238	5.99	540	4.52
28	9.45	241	5.94	542	4.46
30	9.29	244	5.94	545	4.46
31	9.19	249	5.88	548	4.46
33	8.87	254	5.83	550	4.46
36	8.61	262	5.83	553	4.46
38	8.34	268	5.83	561	4.41
40	8.08	274	5.72	566	4.41
42	7.87	277	5.72	571	4.35
45	7.60	282	5.67	579	4.41
48	7.50	286	5.61	586	4.35
52	7.50	290	5.56	591	4.35
55	7.39	294	5.56	597	4.35
56	7.34	299	5.56	602	4.41
59	7.23	305	5.56	610	4.41
61	7.18	310	5.50	616	4.41
67	7.18	317	5.45	623	4.35
73	7.12	325	5.45	630	4.35
78	7.07	330	5.39	638	4.41
86	7.12	336	5.39	642	4.35
93	7.07	346	5.39	650	4.35
96	7.12	353	5.39	654	4.35
99	7.12	364	5.34	659	4.35
105	7.12	372	5.28	662	4.35
111	7.07	379	5.23	666	4.30
115	7.12	383	5.23	669	4.30
121	7.23	389	5.23	673	4.30
123	7.12	395	5.18	677	4.24
128	7.12	397	5.18	679	4.24
132	7.12	402	5.12	684	4.24
138	7.12	405	5.07	686	4.24
141	7.07	409	5.07	689	4.24
146	6.96	411	5.07	692	4.18
149	6.91	417	5.01	698	4.13
154	6.85	424	4.96	704	4.13
159	6.75	430	4.96	708	4.07
162	6.75	435	4.90	713	4.07
166	6.75	442	4.90	716	4.07
168	6.75	450	4.90	720	4.07
170	6.69	458	4.85	723	4.02
174	6.64	463	4.79	728	4.07
177	6.64	469	4.79	733	4.02
181	6.53	474	4.79	737	4.02
185	6.48	480	4.74	742	4.02
188	6.42	484	4.74	747	4.02


TEMPERATURE, C
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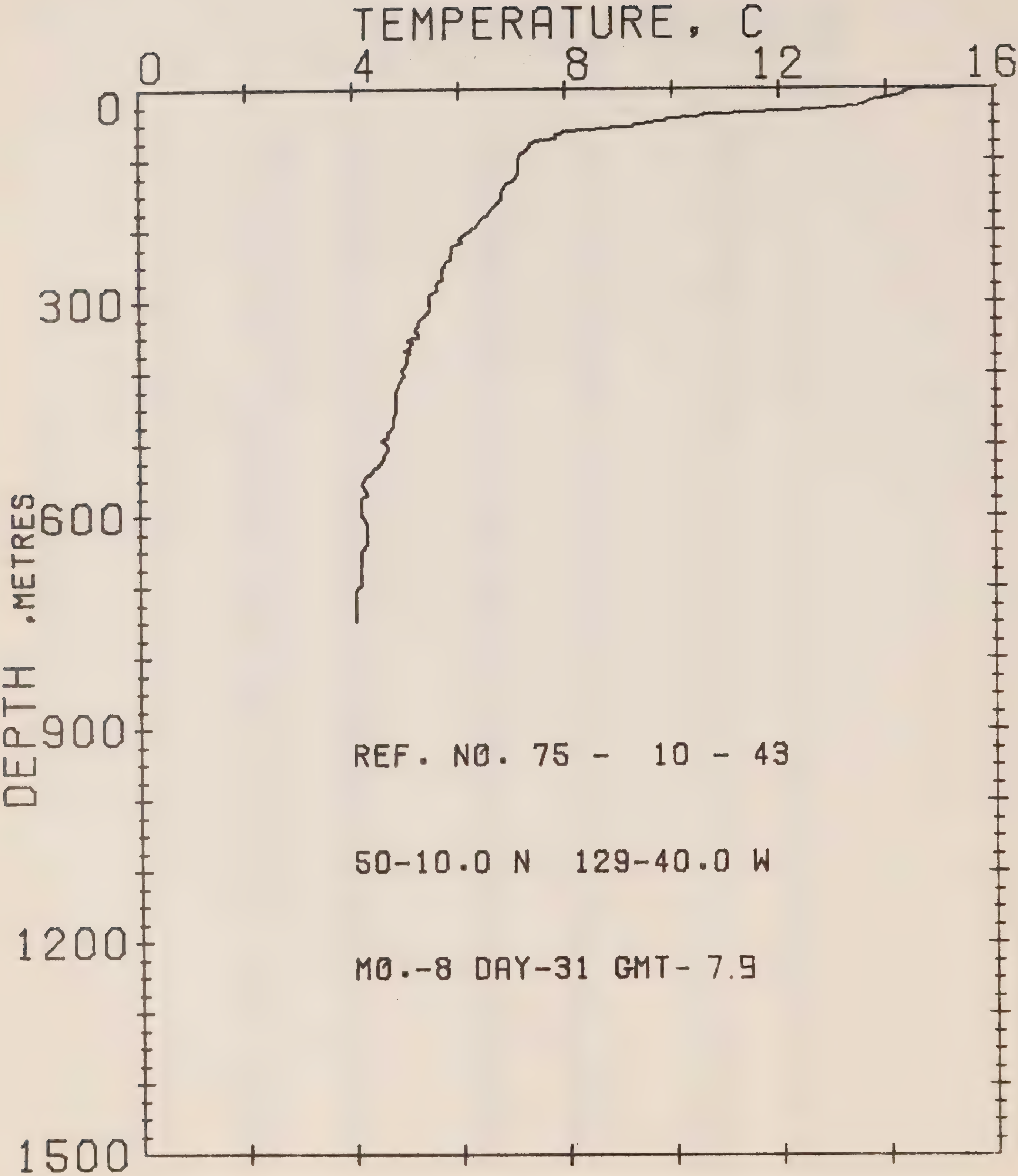
DEPTH ,METRES
REF. NO. 75 - 10 - 42
48-42.0 N 126-40.0 W
MO.-8 DAY-27 GMT- 19.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 42 DATE 27/ 8/75
POSITION 48-42.0N 126-40.0W GMT 19.5
RESULTS OF XBT CAST 176 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.65	132	7.12	357	5.28
2	12.60	135	7.12	365	5.28
4	12.60	138	7.07	372	5.34
7	12.55	140	7.01	382	5.28
8	12.50	144	6.96	389	5.28
10	12.40	146	6.96	394	5.18
11	12.14	148	6.96	396	5.18
12	12.09	151	6.96	399	5.18
13	12.04	157	6.91	403	5.12
15	11.88	160	6.85	407	5.12
16	11.26	162	6.85	409	5.12
17	11.11	165	6.80	413	5.07
18	10.75	166	6.80	419	5.07
19	10.54	168	6.75	422	5.07
20	10.28	169	6.75	427	5.07
23	9.60	173	6.69	429	5.01
24	9.34	176	6.69	431	5.01
25	8.82	179	6.69	435	4.96
26	8.71	181	6.64	443	4.96
27	8.40	183	6.53	450	4.96
28	8.24	186	6.48	457	4.90
29	8.03	190	6.48	462	4.85
33	7.97	194	6.53	467	4.85
36	7.81	196	6.48	471	4.79
39	7.71	199	6.48	479	4.74
40	7.60	203	6.53	488	4.74
41	7.50	207	6.37	496	4.74
43	7.50	212	6.37	509	4.57
46	7.44	216	6.37	514	4.57
47	7.39	220	6.26	522	4.57
49	7.28	225	6.26	530	4.52
51	7.23	234	6.15	538	4.52
52	7.18	240	6.10	544	4.52
54	7.18	245	6.05	550	4.46
56	7.07	250	6.05	559	4.46
58	7.01	260	5.99	571	4.41
62	7.07	266	5.94	578	4.41
65	7.01	272	5.94	586	4.41
69	7.07	278	5.88	596	4.35
73	7.07	280	5.83	610	4.30
75	7.01	286	5.77	622	4.30
76	7.01	290	5.77	639	4.18
77	7.12	294	5.77	650	4.18
78	7.12	299	5.77	654	4.18
80	7.12	301	5.77	657	4.24
82	7.12	304	5.67	659	4.24
85	7.18	310	5.67	661	4.13
95	7.18	315	5.61	665	4.07
98	7.18	322	5.56	672	4.13
99	7.28	325	5.50	691	4.13
102	7.34	329	5.45	703	4.07
104	7.34	334	5.39	716	4.07
107	7.34	336	5.39	723	4.02
111	7.34	340	5.45	730	3.96
114	7.28	341	5.45	737	3.96
119	7.28	343	5.39	744	3.91
121	7.23	348	5.34	747	3.91
123	7.18	351	5.34	749	3.91
128	7.12	354	5.34		


TEMPERATURE, C
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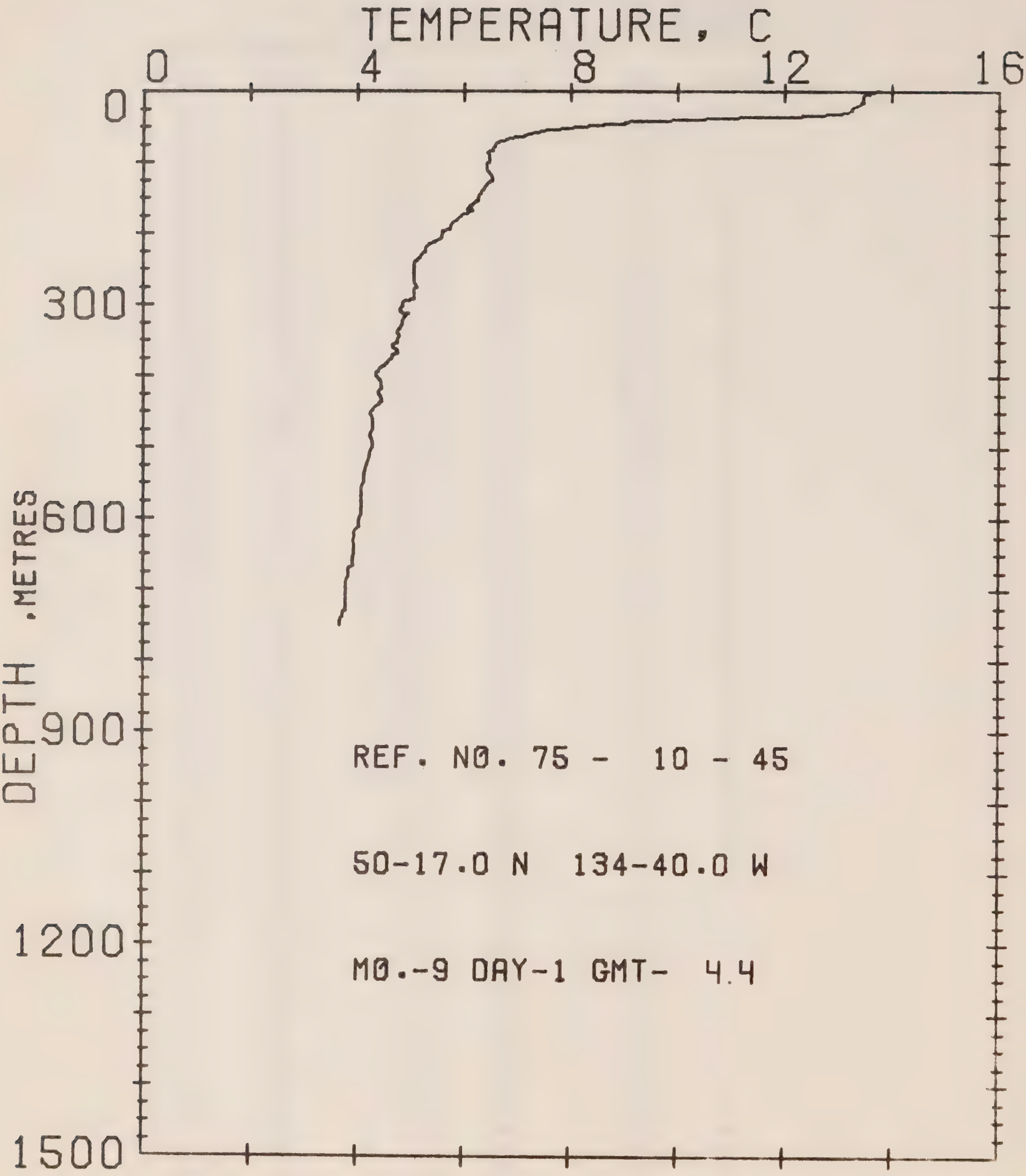
DEPTH .METRES
REF. NO. 75 - 10 - 43
50-10.0 N 129-40.0 W
MO.-8 DAY-31 GMT- 7.9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 43 DATE 31/ 8/75
POSITION 50-10.0N 129-40.0W GMT 7.9
RESULTS OF XBT CAST 199 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	15.25	126	7.07	392	4.96
1	15.20	130	7.01	397	4.90
2	14.49	135	6.91	404	4.96
3	14.44	139	6.85	409	4.90
4	14.44	147	6.80	417	4.85
6	14.38	150	6.80	425	4.79
7	14.33	156	6.80	430	4.79
10	14.33	160	6.75	438	4.79
11	14.18	164	6.69	447	4.79
12	14.13	167	6.64	456	4.79
13	14.08	178	6.53	463	4.74
14	13.98	185	6.42	473	4.74
15	13.93	193	6.32	481	4.68
16	13.83	201	6.21	483	4.63
19	13.72	206	6.10	485	4.63
21	13.62	208	6.05	490	4.63
24	13.57	213	5.99	493	4.52
26	13.47	216	6.05	496	4.57
27	13.37	219	5.99	502	4.63
28	13.21	222	5.88	509	4.63
29	13.01	226	5.88	516	4.57
30	12.80	230	5.88	521	4.57
31	12.55	235	5.83	527	4.52
32	12.29	238	5.83	530	4.46
33	11.98	240	5.83	535	4.35
34	11.52	243	5.77	539	4.35
35	10.80	246	5.72	541	4.30
36	10.64	249	5.72	545	4.24
37	10.59	252	5.67	550	4.18
38	10.59	255	5.67	557	4.13
39	10.44	261	5.67	561	4.18
40	10.28	268	5.67	568	4.24
41	10.07	274	5.56	571	4.24
43	9.92	278	5.56	576	4.13
46	9.86	282	5.56	580	4.13
47	9.76	284	5.56	586	4.13
49	9.60	287	5.50	592	4.13
50	9.45	290	5.45	600	4.13
51	9.34	292	5.45	604	4.18
52	9.24	294	5.45	611	4.24
53	9.24	298	5.45	615	4.24
55	8.98	300	5.45	622	4.24
56	8.71	303	5.45	628	4.24
57	8.45	307	5.45	636	4.24
58	8.29	311	5.45	640	4.24
59	8.19	313	5.45	646	4.18
60	8.03	317	5.39	650	4.13
61	7.97	320	5.34	654	4.13
63	7.92	329	5.23	660	4.13
64	7.81	335	5.23	668	4.13
67	7.81	339	5.18	675	4.13
70	7.81	342	5.18	682	4.13
71	7.71	345	5.23	687	4.13
72	7.60	349	5.23	694	4.13
74	7.50	351	5.18	698	4.13
76	7.39	352	5.07	701	4.07
77	7.34	354	5.01	705	4.02
82	7.34	356	5.07	709	4.02
85	7.28	358	5.12	713	4.02
89	7.23	362	5.07	721	4.02
93	7.18	366	5.07	724	4.02
98	7.12	369	4.96	730	4.02
99	7.12	372	5.07	736	4.02
105	7.12	376	5.01	740	4.02
108	7.12	381	5.01	744	4.02
115	7.12	385	5.01	748	4.02
121	7.12				


TEMPERATURE, C
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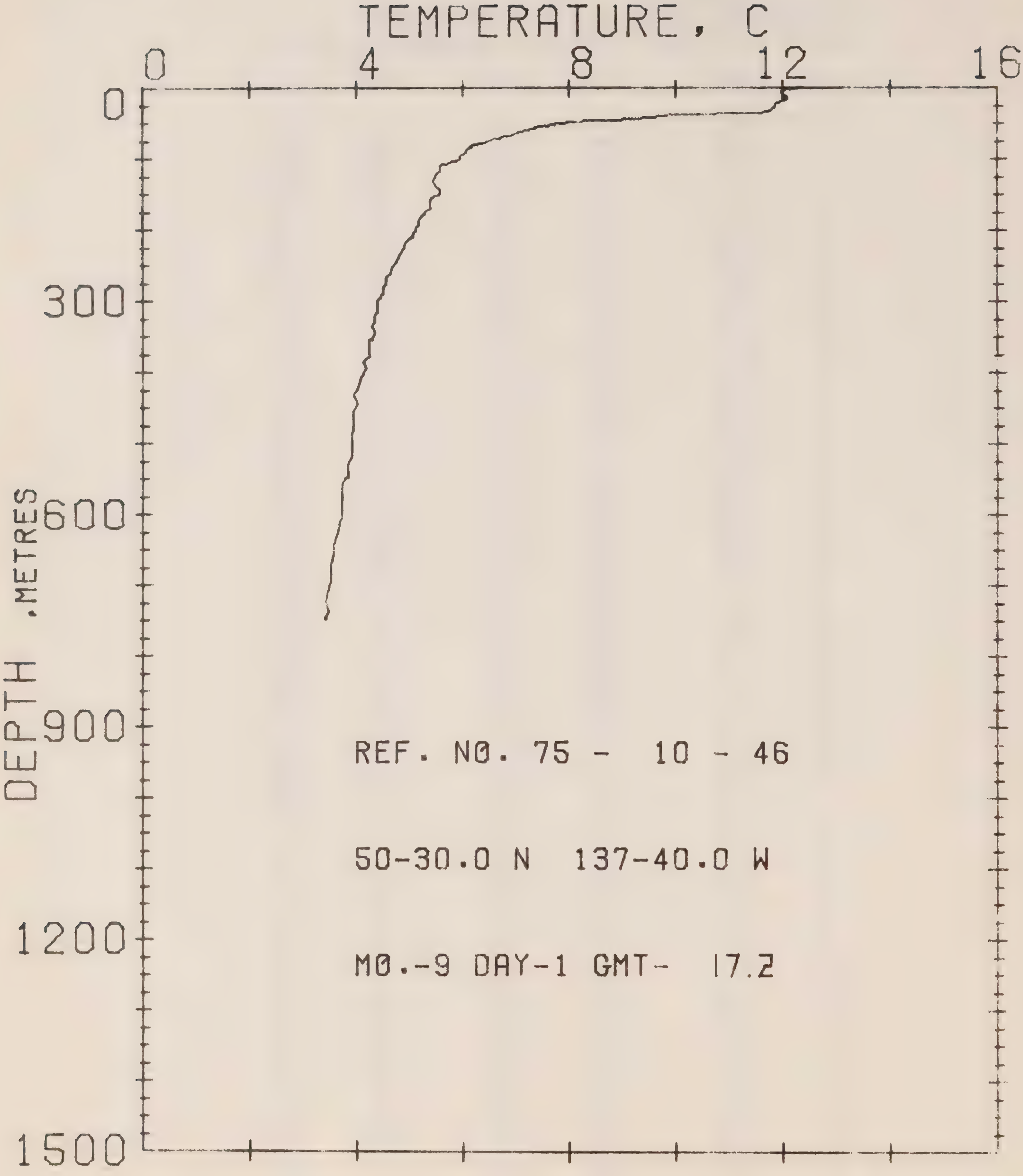
DEPTH .METRES
REF. NO. 75 - 10 - 45
50-17.0 N 134-40.0 W
MO.-9 DAY-1 GMT- 4.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 45 DATE 1/ 9/75
POSITION 50-17.0N 134-40.0W GMT 4.4
RESULTS OF XBT CAST 182 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.77	157	6.21	373	4.68
2	13.62	160	6.15	376	4.63
3	13.57	163	6.10	382	4.57
6	13.47	165	6.05	386	4.52
9	13.47	166	6.10	389	4.46
12	13.47	167	6.15	393	4.41
17	13.47	169	6.10	396	4.35
19	13.42	172	6.05	399	4.35
21	13.32	174	5.94	404	4.41
23	13.26	177	5.94	409	4.46
26	13.26	181	5.88	414	4.46
29	13.26	183	5.83	416	4.46
31	13.16	187	5.77	419	4.46
32	13.01	189	5.77	422	4.41
33	12.86	193	5.72	427	4.41
34	12.60	197	5.61	432	4.46
35	11.98	200	5.61	435	4.46
36	11.68	204	5.56	436	4.46
38	10.59	207	5.56	440	4.41
39	10.44	211	5.45	447	4.30
40	10.13	216	5.34	453	4.24
41	9.66	220	5.28	460	4.30
42	9.29	226	5.28	473	4.30
43	9.19	229	5.23	484	4.24
45	9.03	234	5.18	494	4.30
46	8.98	238	5.12	500	4.30
47	8.77	241	5.07	506	4.24
48	8.45	246	5.07	511	4.24
50	8.19	250	5.07	524	4.18
52	7.92	255	5.07	537	4.13
54	7.71	260	5.07	547	4.13
55	7.55	262	5.07	557	4.07
58	7.39	266	5.07	567	4.07
61	7.23	270	5.07	575	4.07
63	7.12	275	5.12	584	4.07
65	6.96	279	5.07	593	4.07
69	6.80	284	5.07	602	4.02
73	6.64	289	5.07	611	4.02
75	6.59	292	5.07	617	3.96
77	6.59	294	4.96	624	3.96
82	6.53	296	4.85	632	3.91
84	6.53	298	4.85	639	3.96
87	6.42	302	4.85	646	3.96
89	6.48	305	4.79	650	3.96
91	6.48	309	4.79	655	3.91
94	6.48	312	4.85	660	3.91
96	6.48	313	4.96	666	3.91
99	6.48	316	4.90	671	3.85
101	6.42	322	4.85	677	3.85
104	6.42	328	4.85	682	3.85
108	6.42	334	4.79	689	3.80
112	6.42	337	4.74	698	3.80
116	6.48	340	4.74	712	3.80
122	6.53	345	4.79	724	3.80
125	6.53	351	4.74	730	3.80
128	6.48	354	4.74	733	3.74
132	6.42	357	4.68	739	3.74
138	6.37	360	4.68	743	3.68
144	6.32	364	4.74	747	3.68
149	6.26	368	4.74	749	3.68
153	6.26	370	4.68		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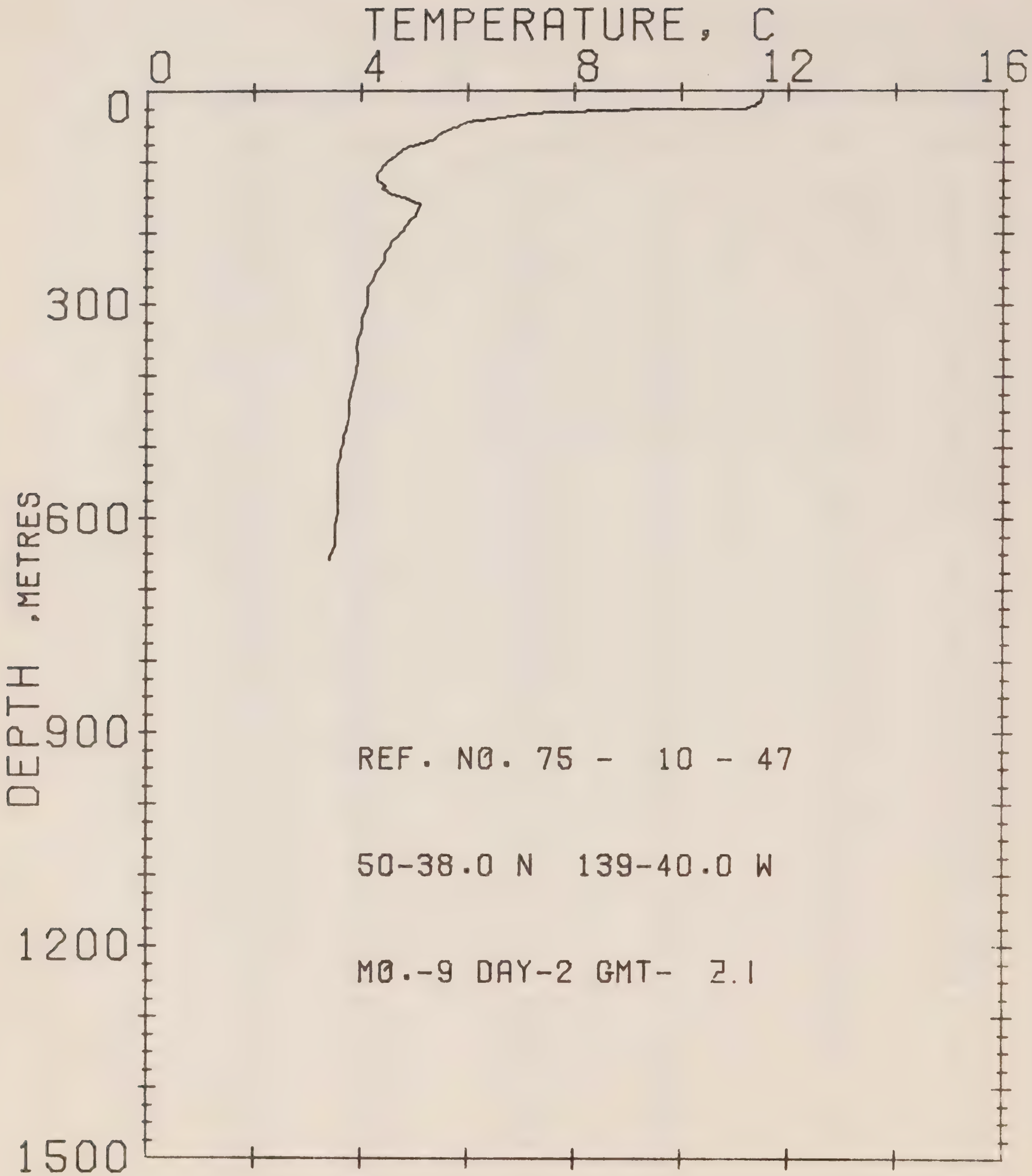
DEPTH ,METRES
REF. NO. 75 - 10 - 46
50-30.0 N 137-40.0 W
MO.-9 DAY-1 GMT- 17.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 46   DATE 1/ 9/75
POSITION 50-30.0N 137-40.0W   GMT 17.2
RESULTS OF XBT CAST   141 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.34	100	5.94	325	4.35
2	12.14	103	5.88	330	4.35
4	12.04	106	5.77	336	4.30
6	11.98	110	5.56	346	4.35
9	11.98	118	5.56	353	4.30
11	12.04	119	5.56	355	4.24
13	12.09	123	5.50	361	4.24
16	12.09	126	5.50	369	4.24
17	12.09	132	5.45	378	4.24
19	12.04	139	5.50	386	4.13
22	11.93	144	5.56	395	4.16
24	11.88	149	5.56	402	4.13
25	11.88	150	5.56	412	4.07
29	11.83	154	5.45	423	4.02
32	11.78	159	5.39	431	3.96
34	11.73	161	5.39	444	4.02
35	11.57	164	5.39	455	3.96
36	11.16	166	5.39	462	3.96
37	10.38	171	5.39	473	3.96
38	9.97	178	5.28	483	3.96
39	9.76	183	5.23	489	3.91
41	9.55	188	5.18	499	3.91
44	9.19	193	5.18	508	3.91
46	8.82	198	5.12	518	3.91
47	8.45	202	5.12	530	3.85
49	8.08	207	5.07	541	3.85
50	7.81	209	5.07	548	3.85
52	7.71	211	5.01	551	3.80
54	7.60	216	4.96	559	3.74
55	7.44	222	4.90	568	3.74
58	7.34	226	4.90	578	3.74
60	7.23	232	4.85	587	3.74
62	7.12	239	4.79	594	3.74
65	7.01	246	4.74	599	3.74
68	6.91	254	4.68	605	3.74
69	6.80	262	4.63	612	3.63
71	6.69	269	4.57	616	3.68
73	6.64	275	4.57	632	3.63
74	6.53	281	4.52	646	3.57
77	6.42	290	4.52	659	3.57
79	6.32	297	4.46	672	3.52
82	6.15	300	4.41	686	3.52
84	6.15	305	4.41	696	3.52
86	6.10	308	4.41	710	3.46
89	6.05	311	4.41	724	3.41
93	6.05	315	4.41	739	3.46
98	5.94	323	4.35	747	3.41


TEMPERATURE, C
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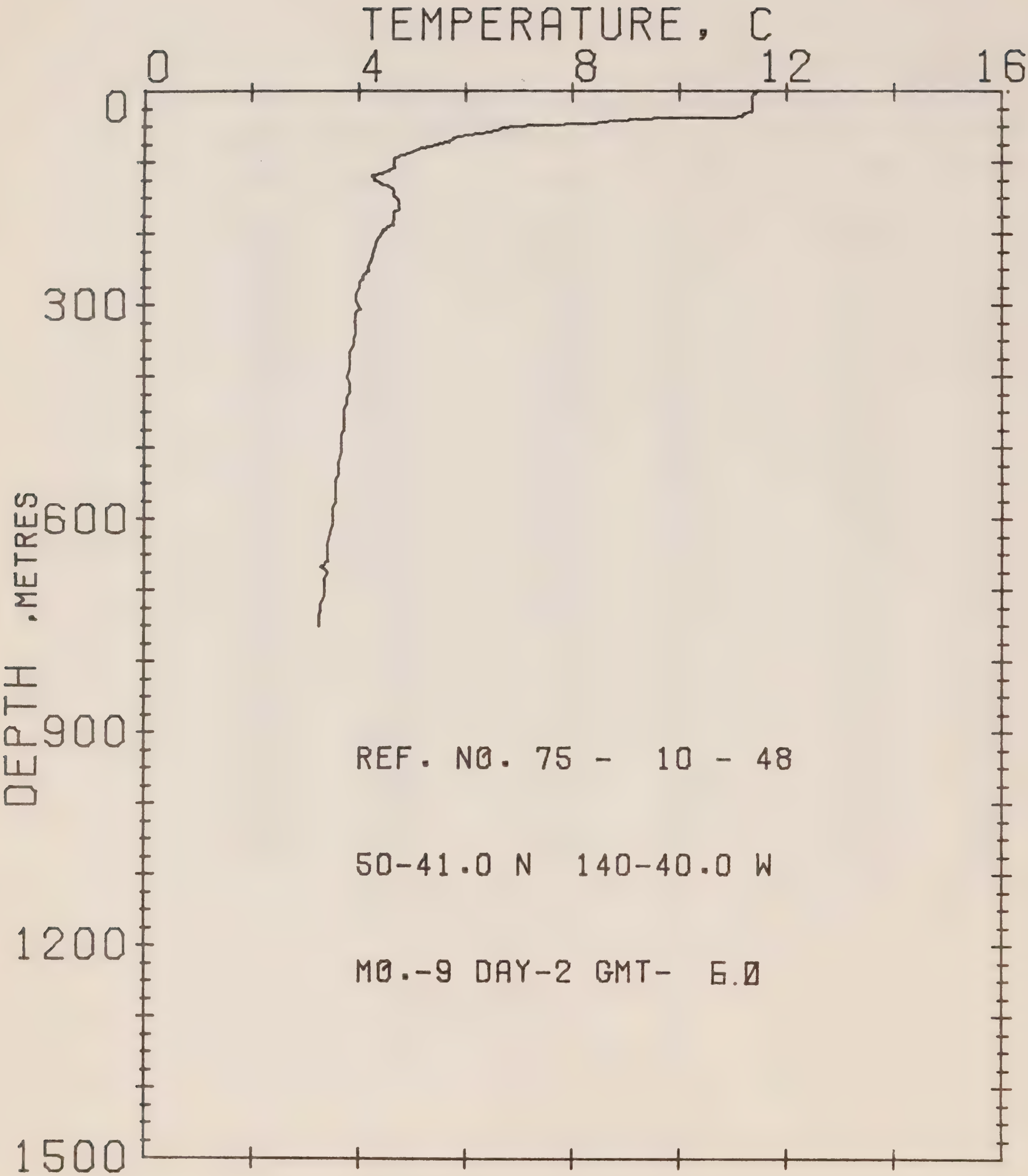
DEPTH ,METRES
REF. NO. 75 - 10 - 47
50-38.0 N 139-40.0 W
MO.-9 DAY-2 GMT- 2.1

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 47 DATE 2/ 9/75
POSITION 50-38.0N 139-40.0W GMT 2.1
RESULTS OF XBT CAST 82 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.52	119	4.30	335	4.02
7	11.52	121	4.30	350	3.96
16	11.47	123	4.30	364	3.91
19	11.42	127	4.30	369	3.96
22	11.37	134	4.46	379	3.96
24	11.26	137	4.41	394	3.91
25	11.21	143	4.52	419	3.85
26	10.59	151	4.85	437	3.80
27	9.45	154	4.90	459	3.80
28	8.61	156	4.96	476	3.74
29	8.45	158	5.01	486	3.68
30	8.03	160	5.12	495	3.68
31	7.60	168	5.07	505	3.63
33	7.23	177	5.01	515	3.63
35	6.80	184	4.90	527	3.57
39	6.42	196	4.79	535	3.57
41	6.21	214	4.57	541	3.57
43	6.10	218	4.57	551	3.57
47	5.94	227	4.46	561	3.57
51	5.83	238	4.46	577	3.57
55	5.67	253	4.30	592	3.57
59	5.50	267	4.24	612	3.52
68	5.39	276	4.13	627	3.52
75	5.07	288	4.13	638	3.52
80	4.85	299	4.13	648	3.46
85	4.74	309	4.07	654	3.41
96	4.57	319	4.02	659	3.41
105	4.46				


TEMPERATURE, C
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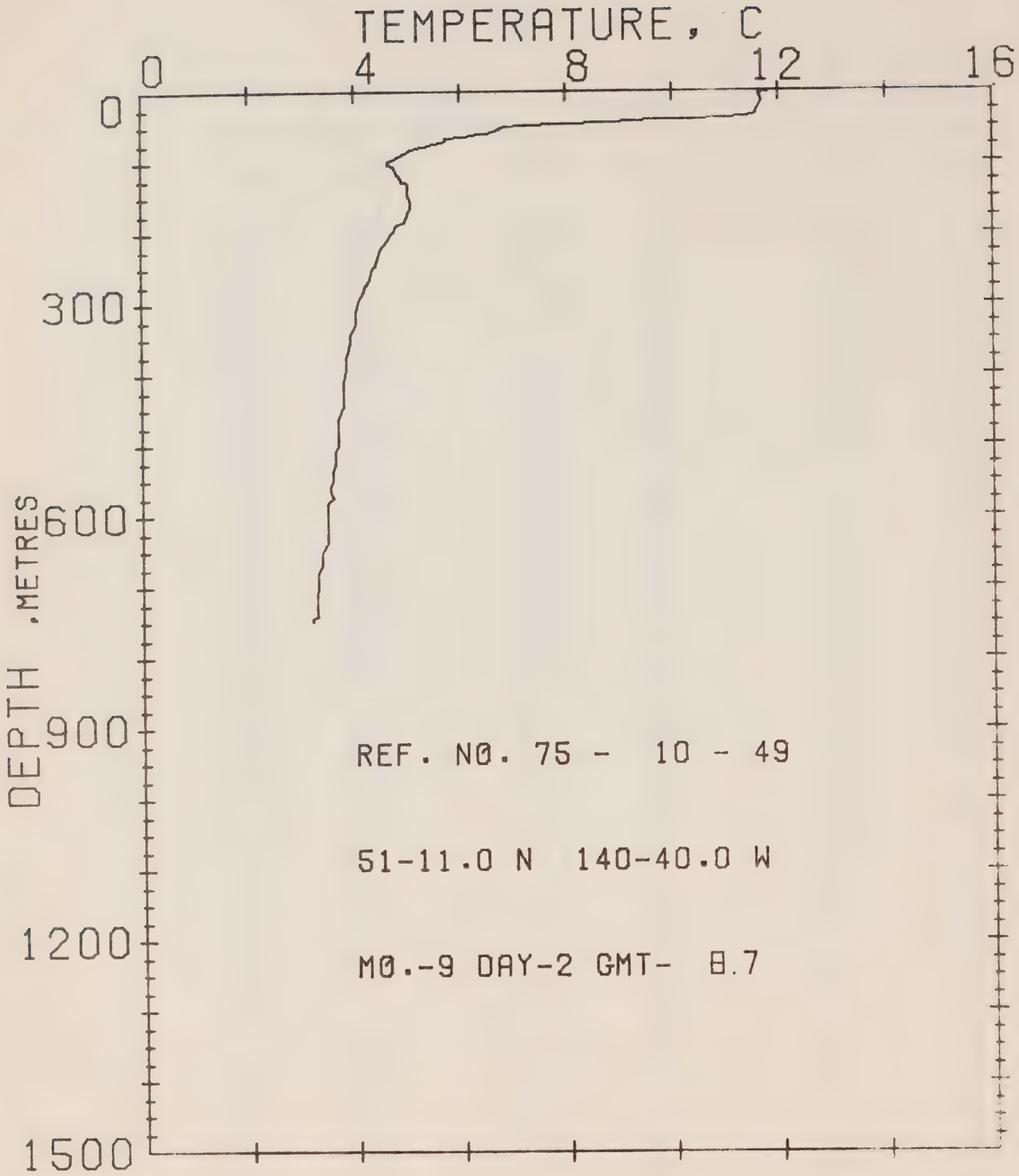
DEPTH ,METRES
REF. NO. 75 - 10 - 48
50-41.0 N 140-40.0 W
MO.-9 DAY-2 GMT- 6.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 48 DATE 2/ 9/75
POSITION 50-41.0N 140-40.0W GMT 6.0
RESULTS OF XBT CAST 127 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.47	129	4.41	340	3.96
3	11.42	131	4.46	350	3.91
7	11.37	135	4.57	356	3.91
13	11.37	138	4.63	365	3.85
17	11.37	139	4.68	375	3.85
22	11.37	142	4.68	391	3.85
25	11.37	143	4.63	402	3.80
28	11.37	145	4.63	410	3.85
31	11.32	148	4.68	422	3.85
33	11.21	153	4.74	431	3.80
36	11.16	155	4.74	438	3.80
37	11.01	162	4.74	446	3.74
38	9.76	166	4.74	458	3.74
40	9.19	171	4.68	470	3.74
41	8.92	176	4.68	475	3.74
43	8.77	180	4.68	483	3.68
45	8.61	184	4.63	495	3.68
46	8.34	187	4.63	507	3.68
49	7.39	191	4.57	524	3.63
51	6.91	194	4.52	537	3.63
52	6.75	197	4.46	546	3.57
54	6.64	199	4.46	558	3.57
57	6.46	203	4.41	576	3.57
59	6.26	210	4.35	585	3.52
62	6.05	224	4.30	596	3.52
65	5.88	239	4.24	608	3.52
67	5.77	246	4.18	621	3.46
71	5.67	252	4.18	638	3.41
74	5.56	256	4.13	650	3.41
78	5.34	259	4.07	660	3.41
83	5.12	261	4.07	665	3.35
89	4.85	264	4.07	669	3.29
93	4.74	268	4.02	672	3.35
96	4.68	275	4.02	676	3.41
99	4.68	286	3.96	685	3.35
104	4.68	297	3.96	694	3.35
108	4.63	306	4.02	708	3.35
112	4.57	313	3.96	721	3.29
115	4.46	321	3.96	729	3.29
118	4.30	324	3.91	736	3.24
121	4.24	327	3.96	744	3.24
123	4.30	332	3.96	749	3.24
125	4.30				


TEMPERATURE, C
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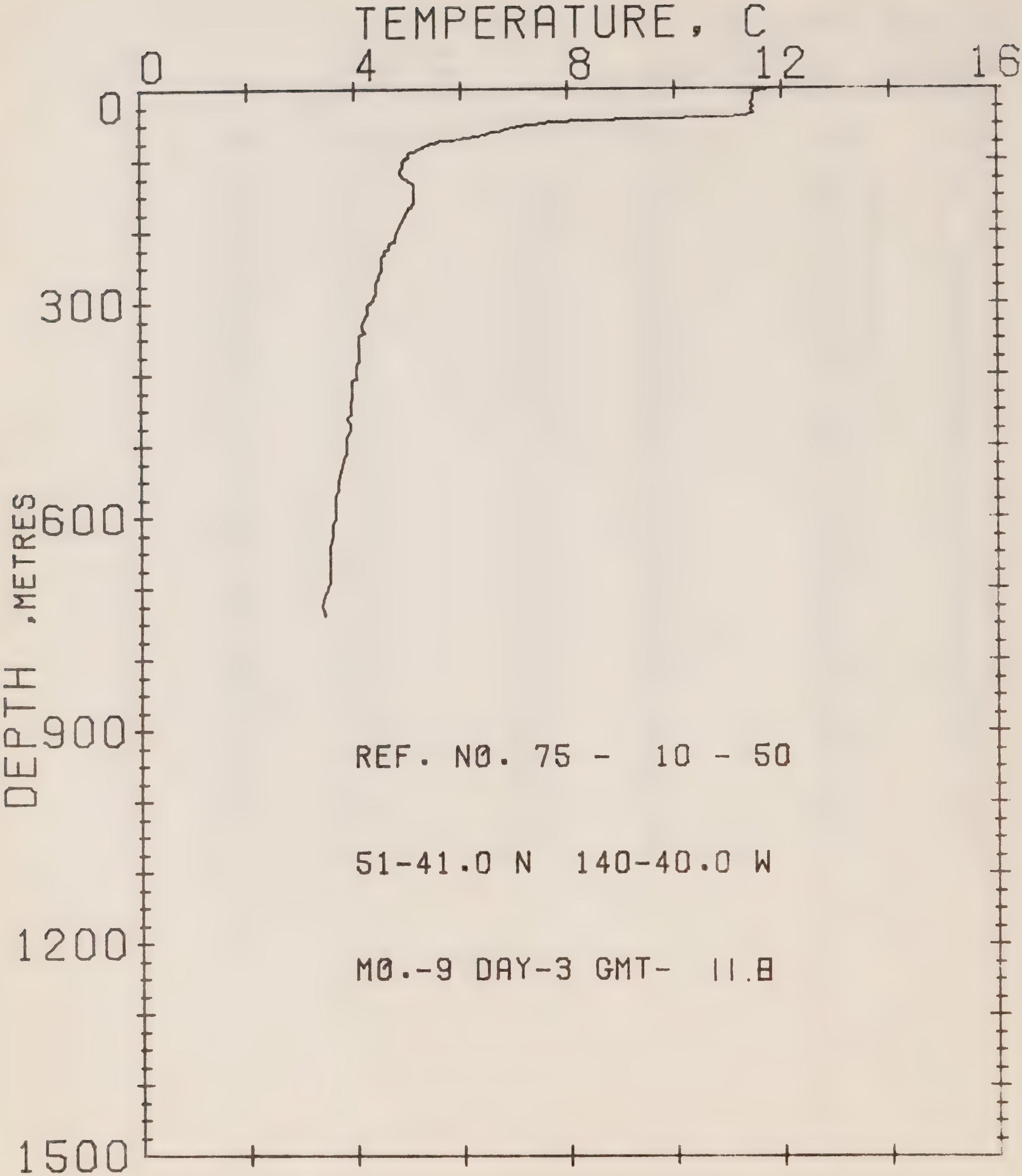
DEPTH ,METRES
REF. NO. 75 - 10 - 49
51-11.0 N 140-40.0 W
MO.-9 DAY-2 GMT- 8.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 49 DATE 2/ 9/75
POSITION 51-11.0N 140-40.0W GMT 8.7
RESULTS OF XBT CAST 83 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	11.78	130	5.01	473	3.68
4	11.62	146	5.01	489	3.66
6	11.62	148	5.01	501	3.68
13	11.68	153	5.07	509	3.65
33	11.57	164	5.07	516	3.65
36	11.42	174	5.01	527	3.65
38	10.95	185	4.96	538	3.57
39	10.38	191	4.79	549	3.57
40	9.71	205	4.68	559	3.52
44	8.82	221	4.52	566	3.52
46	7.92	246	4.41	573	3.57
48	7.23	250	4.35	583	3.46
50	6.85	264	4.30	597	3.46
53	6.75	272	4.24	610	3.46
60	6.53	278	4.18	621	3.46
61	6.37	281	4.18	629	3.46
63	6.10	297	4.07	635	3.46
66	5.72	312	4.02	644	3.41
70	5.72	327	4.02	653	3.35
75	5.45	344	3.91	667	3.35
83	5.07	357	3.91	682	3.29
91	4.90	375	3.85	701	3.29
100	4.63	392	3.85	715	3.24
104	4.63	412	3.80	730	3.24
108	4.74	432	3.80	741	3.24
117	4.79	444	3.80	745	3.18
120	4.85	454	3.74	748	3.18
128	4.90	461	3.68		


TEMPERATURE, C
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300
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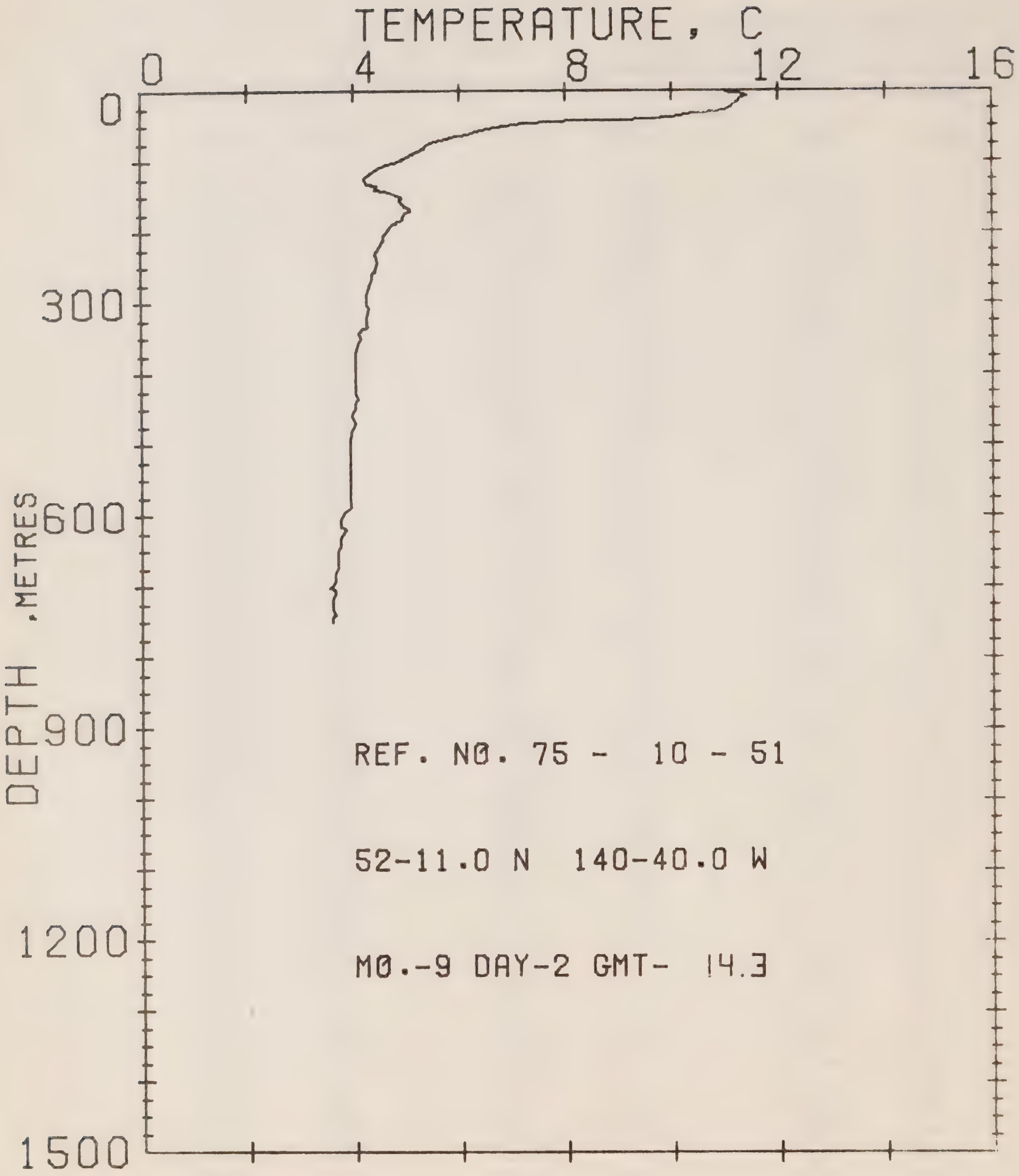
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 50
51-41.0 N 140-40.0 W
MO.-9 DAY-3 GMT- 11.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 50 DATE 3/ 9/75
POSITION 51-41.0N 140-40.0W GMT 11.8
RESULTS OF XBT CAST 152 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.68	115	4.85	353	4.07
3	11.57	120	4.85	354	4.07
5	11.52	124	4.90	358	4.07
7	11.47	130	5.01	362	4.07
10	11.47	135	5.12	368	4.07
14	11.47	143	5.12	377	4.07
17	11.47	147	5.12	382	4.07
21	11.42	151	5.12	389	4.02
27	11.47	156	5.12	396	4.02
31	11.42	161	5.12	401	4.02
34	11.47	165	5.07	406	4.02
38	11.32	168	5.01	409	3.96
39	10.95	178	4.96	415	3.96
40	10.54	185	4.90	419	3.96
41	9.86	192	4.85	425	3.96
42	9.71	200	4.79	432	3.96
43	9.39	214	4.74	440	3.91
44	8.40	217	4.68	445	3.91
45	8.13	220	4.63	450	3.91
46	7.97	224	4.63	456	3.91
47	7.71	228	4.57	461	3.85
49	7.55	232	4.57	470	3.91
50	7.39	236	4.52	477	3.91
51	7.28	241	4.52	489	3.85
52	7.12	245	4.52	501	3.85
55	7.01	250	4.52	510	3.85
56	6.85	253	4.52	521	3.80
59	6.75	261	4.46	536	3.74
61	6.59	266	4.46	550	3.68
63	6.48	271	4.41	561	3.68
66	6.32	278	4.41	571	3.63
68	6.10	282	4.41	578	3.63
71	5.83	289	4.41	592	3.63
72	5.67	294	4.35	602	3.63
74	5.56	297	4.35	611	3.57
77	5.39	301	4.30	625	3.57
81	5.28	304	4.24	641	3.52
85	5.18	311	4.24	649	3.52
91	5.01	317	4.24	661	3.52
95	5.01	323	4.18	672	3.52
98	4.96	331	4.13	692	3.52
101	4.90	337	4.13	712	3.41
104	4.90	342	4.18	727	3.35
110	4.90	347	4.07	738	3.41


TEMPERATURE, C
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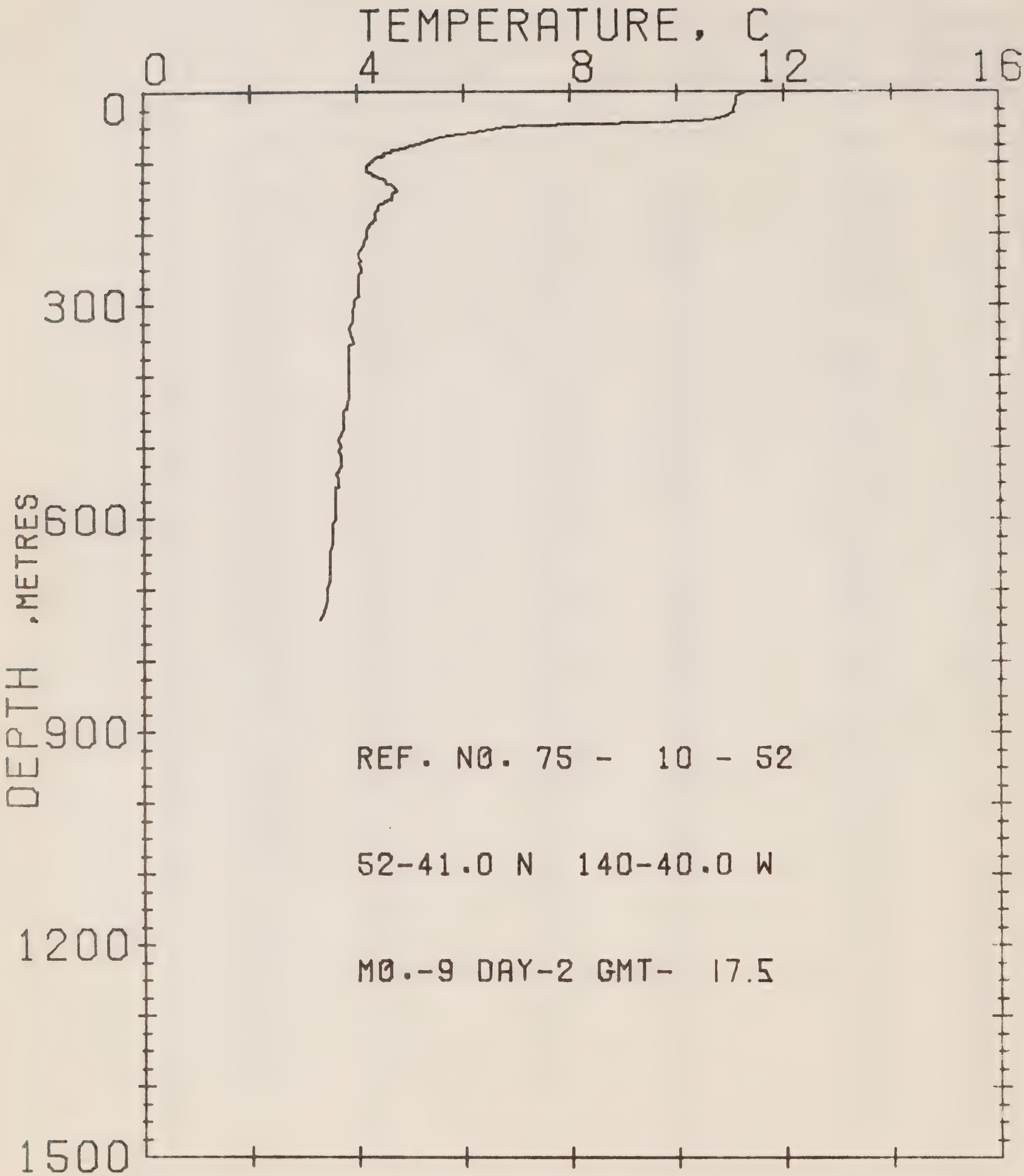
DEPTH ,METRES
REF. NO. 75 - 10 - 51
52-11.0 N 140-40.0 W
MO.-9 DAY-2 GMT- 14.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 51 DATE 2/ 9/75
POSITION 52-11.0N 140-40.0W GMT 14.3
RESULTS OF XBT CAST 118 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.01	144	4.68	428	4.02
2	11.01	148	4.79	435	4.07
3	11.06	151	4.90	442	4.02
4	11.26	157	4.85	449	4.02
7	11.42	161	4.90	460	3.96
10	11.32	164	4.96	470	4.02
15	11.26	168	5.07	481	3.96
19	11.21	171	5.07	487	3.96
24	11.11	174	4.96	494	3.91
28	11.01	181	4.90	506	3.91
31	10.80	187	4.79	528	3.91
32	10.59	188	4.74	550	3.91
33	10.38	197	4.68	575	3.91
35	10.18	206	4.57	589	3.91
37	9.97	211	4.57	598	3.80
39	9.66	219	4.52	607	3.74
41	8.98	226	4.46	616	3.74
43	8.24	232	4.41	620	3.85
44	7.81	243	4.46	627	3.80
47	7.23	255	4.41	631	3.74
50	6.85	259	4.35	640	3.74
56	6.42	265	4.35	644	3.74
63	6.05	278	4.30	651	3.68
65	5.94	290	4.24	659	3.68
70	5.67	298	4.24	665	3.68
74	5.45	303	4.24	674	3.68
82	5.34	308	4.30	681	3.63
91	5.12	322	4.24	692	3.63
96	4.90	334	4.24	700	3.57
101	4.79	340	4.13	702	3.52
105	4.63	343	4.07	705	3.63
110	4.46	350	4.13	710	3.63
117	4.30	359	4.07	717	3.57
125	4.18	373	4.02	722	3.57
131	4.24	382	4.02	732	3.57
133	4.30	392	4.02	740	3.63
134	4.35	407	4.02	745	3.57
135	4.46	413	4.02	747	3.57
139	4.41	421	4.02	749	3.57
142	4.52				


TEMPERATURE, C
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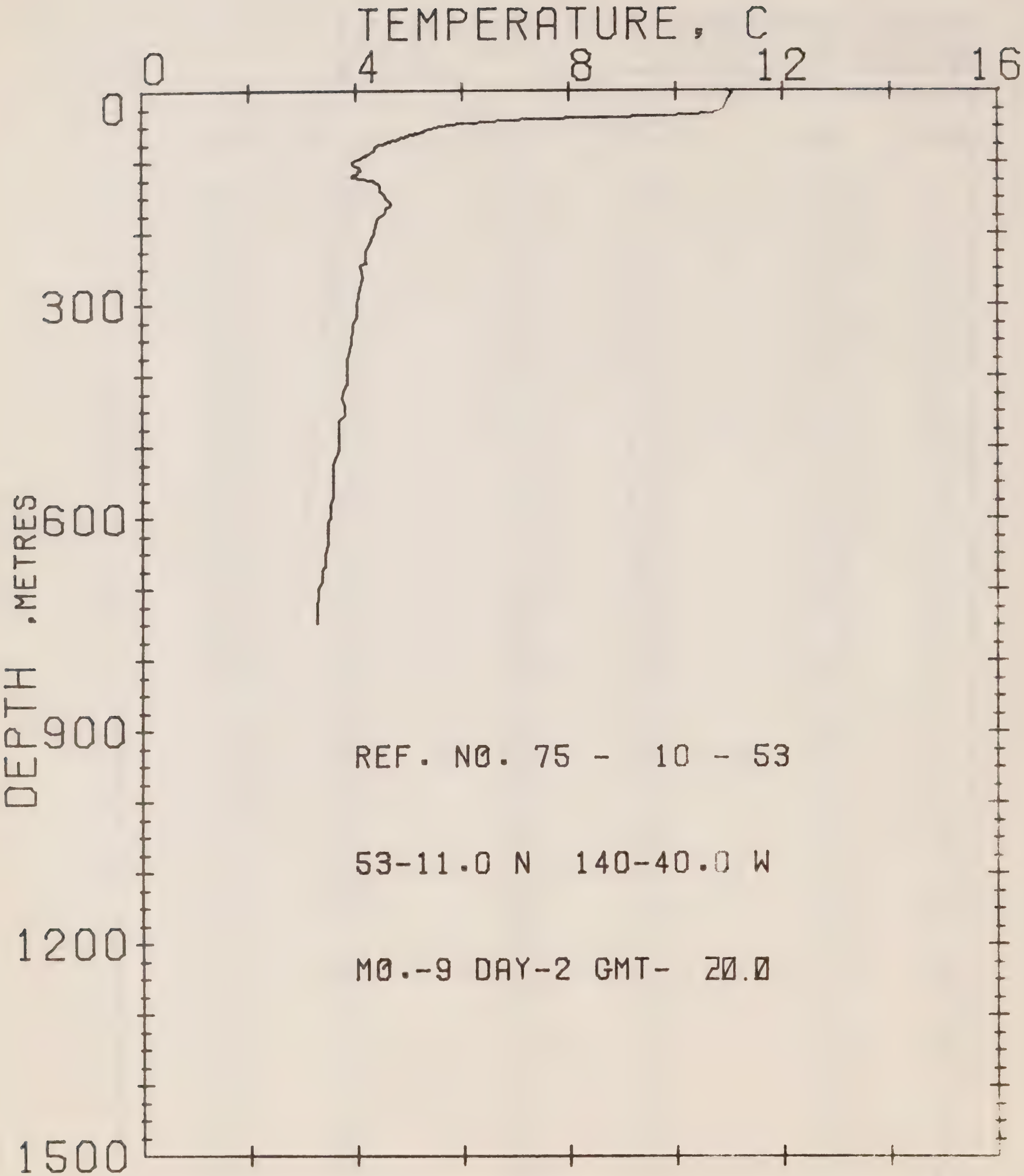
DEPTH ,METRES
REF. NØ. 75 - 10 - 52
52-41.0 N 140-40.0 W
MØ.-9 DAY-2 GMT- 17.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 52 DATE 2/ 9/75
POSITION 52-41.0N 140-40.0W GMT 17.5
RESULTS OF XBT CAST 129 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP
1	11.26
4	11.21
8	11.11
14	11.11
19	11.11
24	11.06
28	11.06
30	11.06
34	10.95
36	10.90
37	10.80
39	10.70
40	10.59
41	10.49
42	10.28
43	10.07
44	9.75
45	9.24
46	8.66
47	7.97
48	7.60
49	7.12
50	6.91
51	6.80
54	6.53
56	6.37
58	6.21
61	5.94
65	5.56
67	5.45
69	5.39
74	5.18
76	5.07
78	4.96
80	4.90
82	4.66
85	4.63
87	4.52
90	4.52
92	4.46
94	4.35
98	4.30
101	4.24
106	4.18
110	4.18
113	4.18
118	4.30
124	4.52
129	4.57
132	4.68
139	4.74
143	4.68
146	4.68
148	4.68
151	4.63
154	4.57
157	4.52
162	4.41
166	4.41
170	4.35
174	4.35
177	4.35
180	4.35
185	4.30
187	4.24
191	4.24
195	4.18
200	4.18
204	4.18
207	4.18
212	4.13
216	4.13
223	4.07
229	4.02
235	4.02
239	4.07
242	4.02
248	4.07
254	4.07
258	4.02
265	4.02
272	4.02
278	4.02
282	4.02
288	4.02
294	3.96
301	3.96
309	3.91
321	3.91
334	3.85
354	3.91
358	3.85
387	3.85
410	3.85
432	3.85
446	3.80
451	3.74
457	3.74
465	3.74
474	3.74
484	3.68
490	3.65
500	3.68
506	3.63
511	3.68
516	3.68
527	3.68
534	3.65
539	3.57
544	3.65
550	3.63
555	3.65
557	3.57
568	3.57
574	3.57
582	3.57
593	3.57
601	3.57
610	3.52
621	3.52
635	3.52
648	3.46
657	3.46
672	3.46
687	3.46
701	3.41
715	3.41
729	3.35
741	3.29


TEMPERATURE, C
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16
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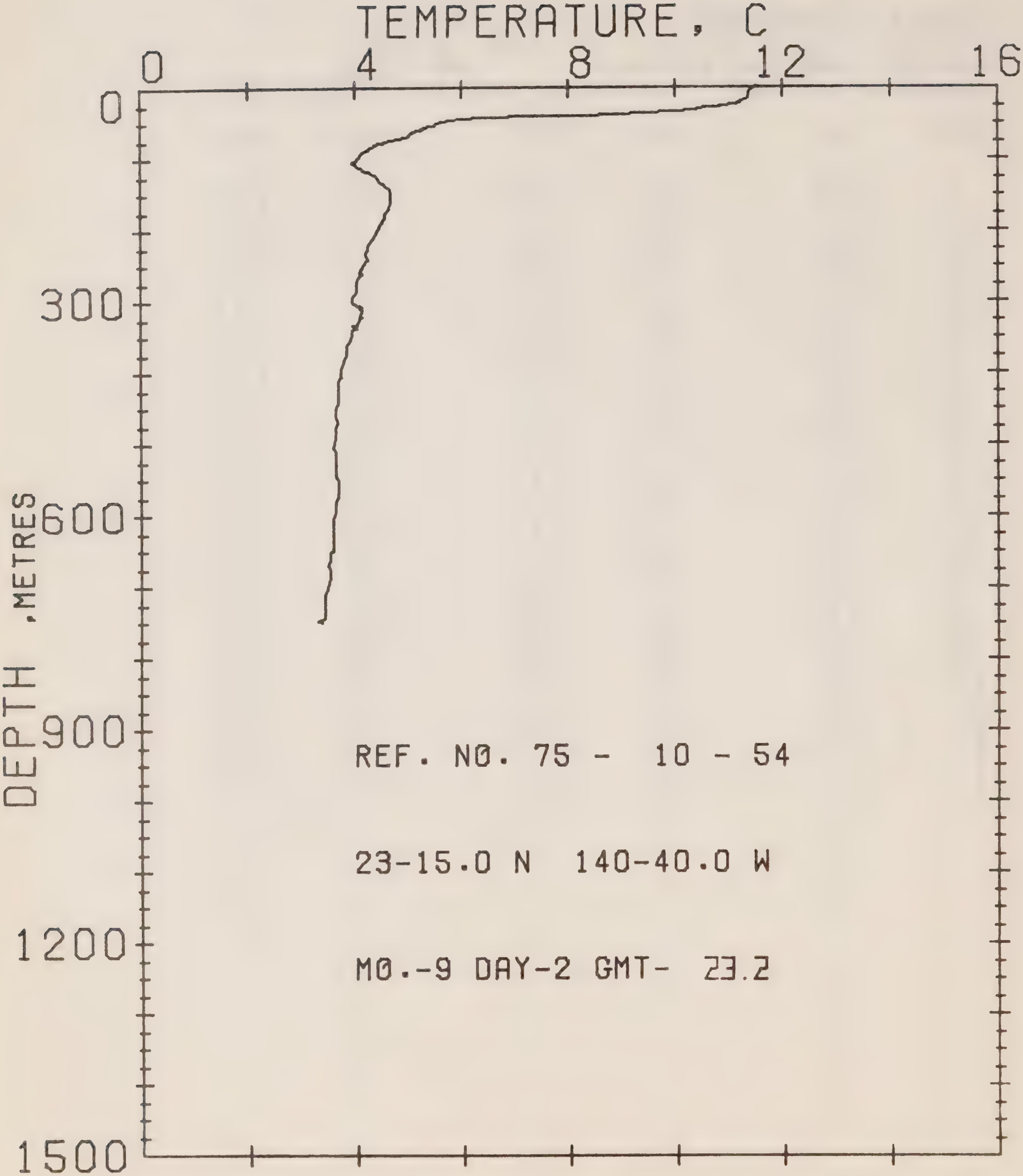
DEPTH ,METRES
REF. N0. 75 - 10 - 53
53-11.0 N 140-40.0 W
M0.-9 DAY-2 GMT- 20.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 53 . DATE 2/ 9/75
POSITION 53-11.0N 140-40.0W GMT 20.0
RESULTS OF XBT CAST 80 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	10.95	126	4.24	465	3.68
3	11.06	128	4.35	474	3.68
10	11.01	134	4.46	486	3.68
16	10.95	142	4.46	504	3.68
25	10.90	159	4.68	525	3.57
32	10.70	163	4.63	540	3.57
35	9.81	166	4.57	551	3.57
37	8.55	171	4.57	560	3.57
39	7.34	182	4.41	571	3.57
44	6.42	201	4.35	581	3.52
46	6.21	209	4.30	585	3.52
47	5.99	227	4.13	594	3.52
48	5.77	242	4.18	600	3.52
55	5.39	246	4.07	605	3.46
57	5.28	263	4.13	619	3.46
63	4.96	279	4.07	636	3.46
71	4.63	299	4.02	653	3.41
77	4.41	315	4.02	669	3.41
84	4.35	330	3.96	674	3.35
92	4.18	354	3.91	687	3.35
99	3.96	377	3.85	701	3.29
101	3.91	398	3.85	715	3.29
105	3.96	412	3.85	722	3.24
111	4.07	419	3.80	734	3.24
113	4.07	431	3.74	743	3.24
115	4.02	443	3.80	747	3.24
122	3.91	457	3.80		


TEMPERATURE, C
0
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12
16
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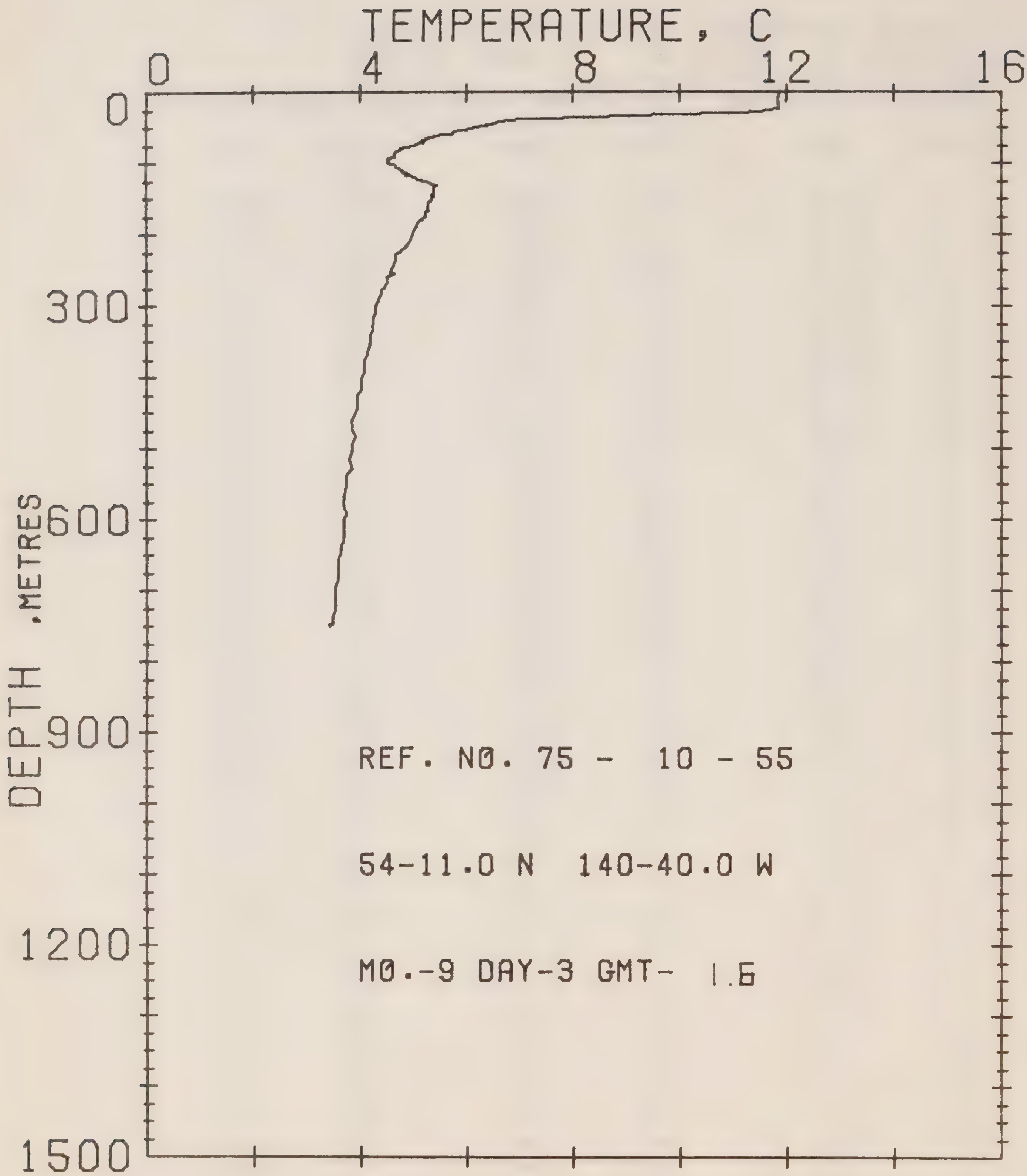
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 54
23-15.0 N 140-40.0 W
MO.-9 DAY-2 GMT- 23.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 54 DATE 2/ 9/75
POSITION 23-15.0N 140-40.0W GMT 23.2
RESULTS OF XBT CAST 135 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.52	146	4.68	385	3.80
5	11.42	149	4.68	396	3.74
9	11.37	152	4.68	407	3.74
15	11.37	157	4.68	413	3.68
17	11.37	163	4.68	423	3.68
21	11.21	170	4.63	433	3.68
23	11.11	178	4.57	441	3.68
27	10.85	182	4.57	450	3.63
28	10.80	185	4.57	460	3.63
29	10.54	189	4.52	464	3.63
32	10.38	197	4.46	471	3.68
34	9.97	204	4.41	475	3.63
35	9.45	212	4.35	480	3.63
37	8.87	222	4.24	491	3.63
39	8.29	228	4.24	505	3.57
40	7.39	234	4.13	510	3.63
42	6.42	242	4.24	515	3.63
45	5.99	247	4.13	520	3.63
46	5.83	254	4.13	530	3.63
49	5.61	259	4.07	542	3.63
53	5.50	261	4.13	546	3.63
55	5.45	267	4.07	551	3.68
56	5.34	272	4.02	562	3.68
57	5.28	280	4.02	573	3.68
60	5.23	286	4.02	579	3.63
62	5.12	293	3.96	582	3.63
64	5.07	299	3.96	594	3.63
68	5.01	302	3.96	607	3.57
72	4.85	306	4.02	611	3.57
74	4.63	308	4.13	622	3.57
77	4.52	310	4.07	635	3.57
80	4.41	313	4.13	649	3.57
83	4.35	315	4.13	653	3.52
88	4.24	321	4.07	663	3.52
93	4.13	323	4.13	671	3.46
98	4.07	326	4.07	675	3.52
102	4.02	333	4.02	687	3.52
106	3.96	335	3.96	702	3.46
110	4.02	337	4.02	711	3.41
116	4.13	339	4.02	721	3.41
121	4.30	340	3.96	730	3.41
127	4.41	346	3.96	737	3.41
132	4.46	354	3.91	744	3.41
136	4.57	362	3.85	747	3.29
142	4.63	374	3.85	749	3.35


TEMPERATURE, C
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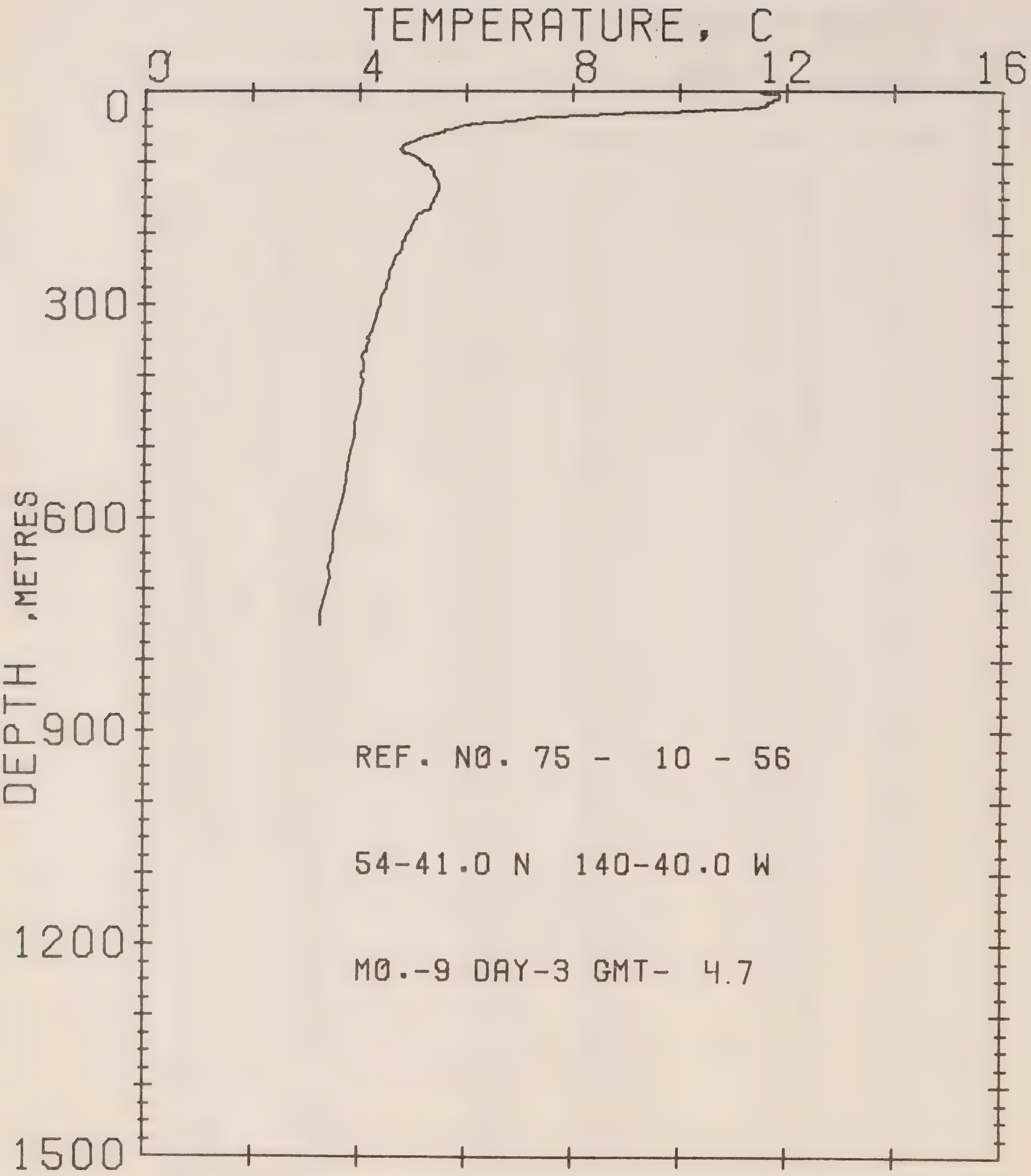
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 55
54-11.0 N 140-40.0 W
MO.-9 DAY-3 GMT- 1.6

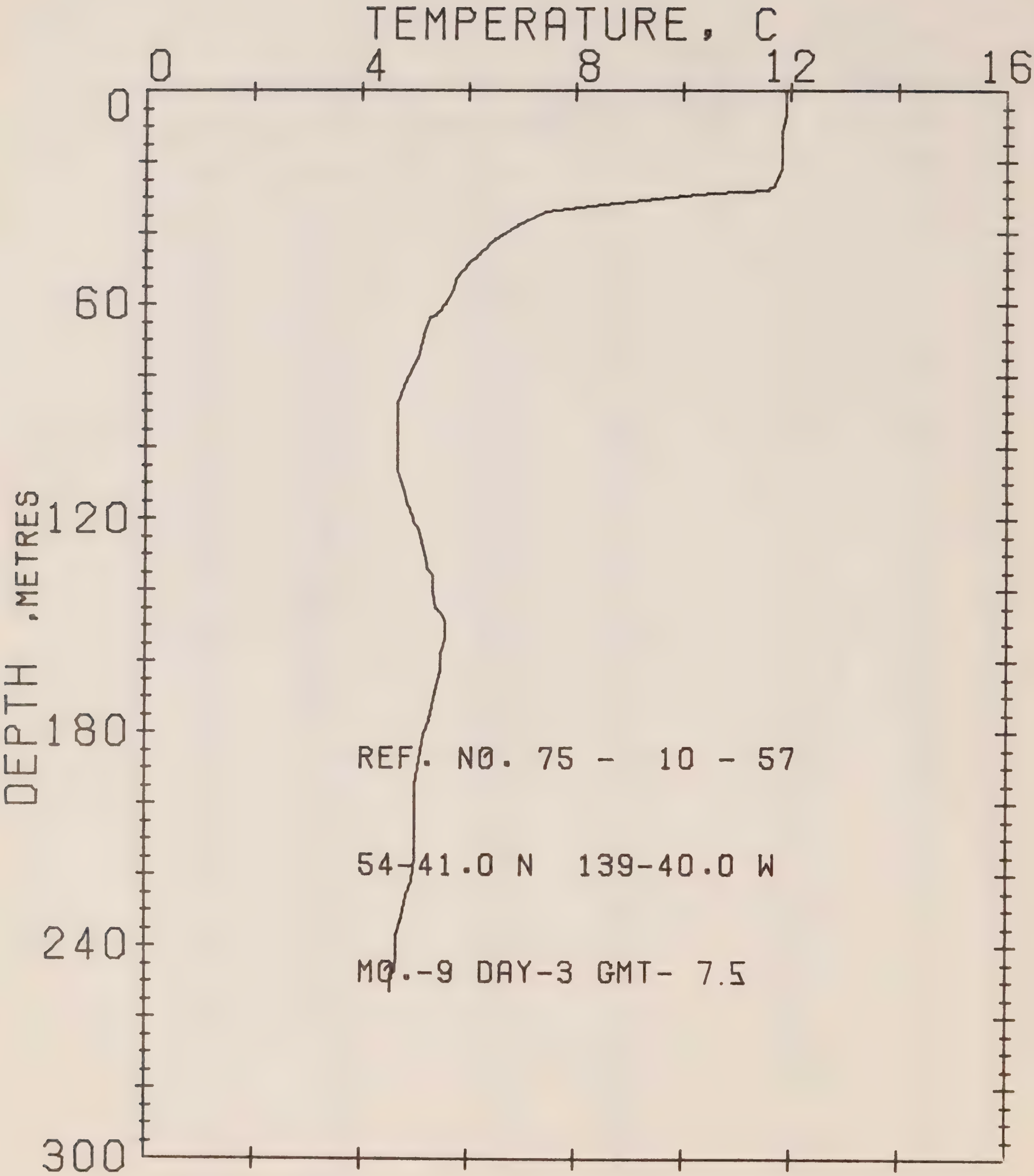
OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 55   DATE 3/ 9/75
POSITION 54-11.0N 140-40.0W   GMT 1.6
RESULTS OF XBT CAST   157 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.88	114	4.79	325	4.24
4	11.88	115	4.90	330	4.24
8	11.83	118	4.85	334	4.24
13	11.83	120	5.01	342	4.18
17	11.83	123	5.07	350	4.18
20	11.83	124	5.12	357	4.18
24	11.83	126	5.18	369	4.13
27	11.66	128	5.23	379	4.07
28	11.47	130	5.34	387	4.07
30	11.11	132	5.39	394	4.07
31	10.90	133	5.45	402	4.02
32	9.86	135	5.39	411	4.02
34	9.13	137	5.39	417	4.02
36	8.19	139	5.39	426	3.96
37	7.50	141	5.39	433	3.96
38	7.01	143	5.39	439	3.96
39	6.91	146	5.34	445	3.96
40	6.80	147	5.34	463	3.85
43	6.69	149	5.39	475	3.85
45	6.53	152	5.34	484	3.91
46	6.48	154	5.34	495	3.85
47	6.37	157	5.23	505	3.85
48	6.37	162	5.28	514	3.80
49	6.32	165	5.28	519	3.80
51	6.21	167	5.28	529	3.85
52	6.10	171	5.23	534	3.80
53	5.99	175	5.23	537	3.74
55	5.88	179	5.18	543	3.74
57	5.77	180	5.18	553	3.74
59	5.72	181	5.12	567	3.68
61	5.61	187	5.07	584	3.68
62	5.45	190	5.07	591	3.74
64	5.39	195	5.01	602	3.68
65	5.34	208	4.96	613	3.68
66	5.28	218	4.85	621	3.68
67	5.23	226	4.74	631	3.68
69	5.18	229	4.68	638	3.63
71	5.18	238	4.68	649	3.63
74	5.07	245	4.63	657	3.57
77	4.96	254	4.57	667	3.57
80	4.79	256	4.63	675	3.57
83	4.74	260	4.52	686	3.57
86	4.68	263	4.52	695	3.52
88	4.63	269	4.52	705	3.52
92	4.63	275	4.46	711	3.52
94	4.57	280	4.41	720	3.52


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 56
54-41.0 N 140-40.0 W
MO.-9 DAY-3 GMT- 4.7

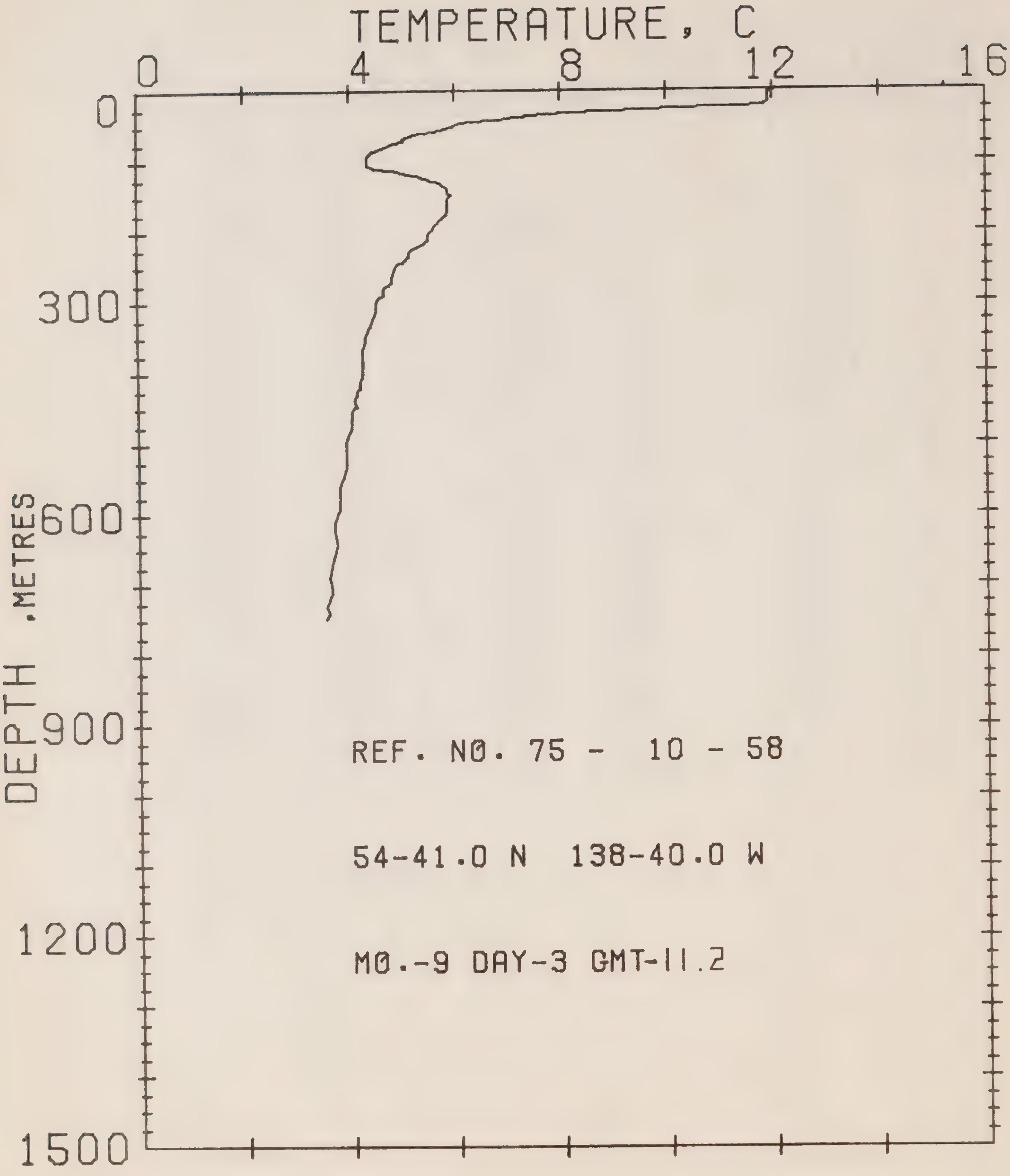
OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 56   DATE 3/ 9/75
POSITION 54-41.0N 140-40.0W   GMT 4.7
RESULTS OF XBT CAST   137 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.52	78	4.79	278	4.52
3	11.57	81	4.79	283	4.46
4	11.68	83	4.74	291	4.41
5	11.78	86	4.79	300	4.41
6	11.88	88	4.85	310	4.35
7	11.88	91	4.96	324	4.30
10	11.88	94	5.07	337	4.24
11	11.83	98	5.12	343	4.18
12	11.73	101	5.18	348	4.13
14	11.73	105	5.23	351	4.18
15	11.73	107	5.34	359	4.13
16	11.68	109	5.34	366	4.13
17	11.62	113	5.39	369	4.07
20	11.62	117	5.39	374	4.02
22	11.57	120	5.39	380	4.07
23	11.47	123	5.45	384	4.07
24	11.26	124	5.45	388	4.07
25	11.06	129	5.50	393	4.07
26	10.64	131	5.50	396	4.02
28	10.28	134	5.50	403	4.02
30	9.71	137	5.50	406	4.07
31	9.19	139	5.50	409	4.07
32	8.77	141	5.50	421	4.02
34	8.19	146	5.45	438	4.02
35	7.65	148	5.45	458	3.96
36	7.39	151	5.39	468	3.91
37	7.23	156	5.39	486	3.91
40	7.07	161	5.34	505	3.85
41	6.85	166	5.34	525	3.80
43	6.80	171	5.18	561	3.74
44	6.64	176	5.07	591	3.63
45	6.48	179	5.07	605	3.57
46	6.15	184	5.01	620	3.52
48	6.05	192	4.96	637	3.52
49	5.99	197	4.96	647	3.52
50	5.88	200	4.90	654	3.46
53	5.72	205	4.85	660	3.46
55	5.61	209	4.85	669	3.41
56	5.61	212	4.79	684	3.46
58	5.56	221	4.79	712	3.35
60	5.45	227	4.74	732	3.29
62	5.39	235	4.68	740	3.29
65	5.23	244	4.63	745	3.29
66	5.12	254	4.57	747	3.29
74	4.90	261	4.57	749	3.29
75	4.85	272	4.52		


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
DEPTH ,METRES
REF. NO. 75 - 10 - 57
54-41.0 N 139-40.0 W
MO.-9 DAY-3 GMT- 7.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 57   DATE 3/ 9/75
POSITION 54-41.0N 139-40.0W   GMT 7.5
RESULTS OF XBT CAST   74 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.93	75	5.07	158	5.50
4	11.93	78	4.96	163	5.50
7	11.93	81	4.85	169	5.39
10	11.88	85	4.74	173	5.34
12	11.83	88	4.68	177	5.28
16	11.83	96	4.68	181	5.18
22	11.83	102	4.68	185	5.12
24	11.78	107	4.68	190	5.07
27	11.68	113	4.79	195	5.01
28	11.57	116	4.85	198	5.01
29	10.54	118	4.90	200	5.01
30	9.76	120	4.96	205	5.01
32	8.50	121	4.96	208	5.01
34	7.44	123	5.07	215	5.01
38	6.91	127	5.12	222	4.96
42	6.48	133	5.23	226	4.85
46	6.21	134	5.23	230	4.79
49	5.99	136	5.34	233	4.74
53	5.77	139	5.34	237	4.68
56	5.72	141	5.34	240	4.68
60	5.56	145	5.39	243	4.63
63	5.39	146	5.45	247	4.63
64	5.28	147	5.50	248	4.57
69	5.18	149	5.56	253	4.57
72	5.12	154	5.56		


TEMPERATURE, C
0
4
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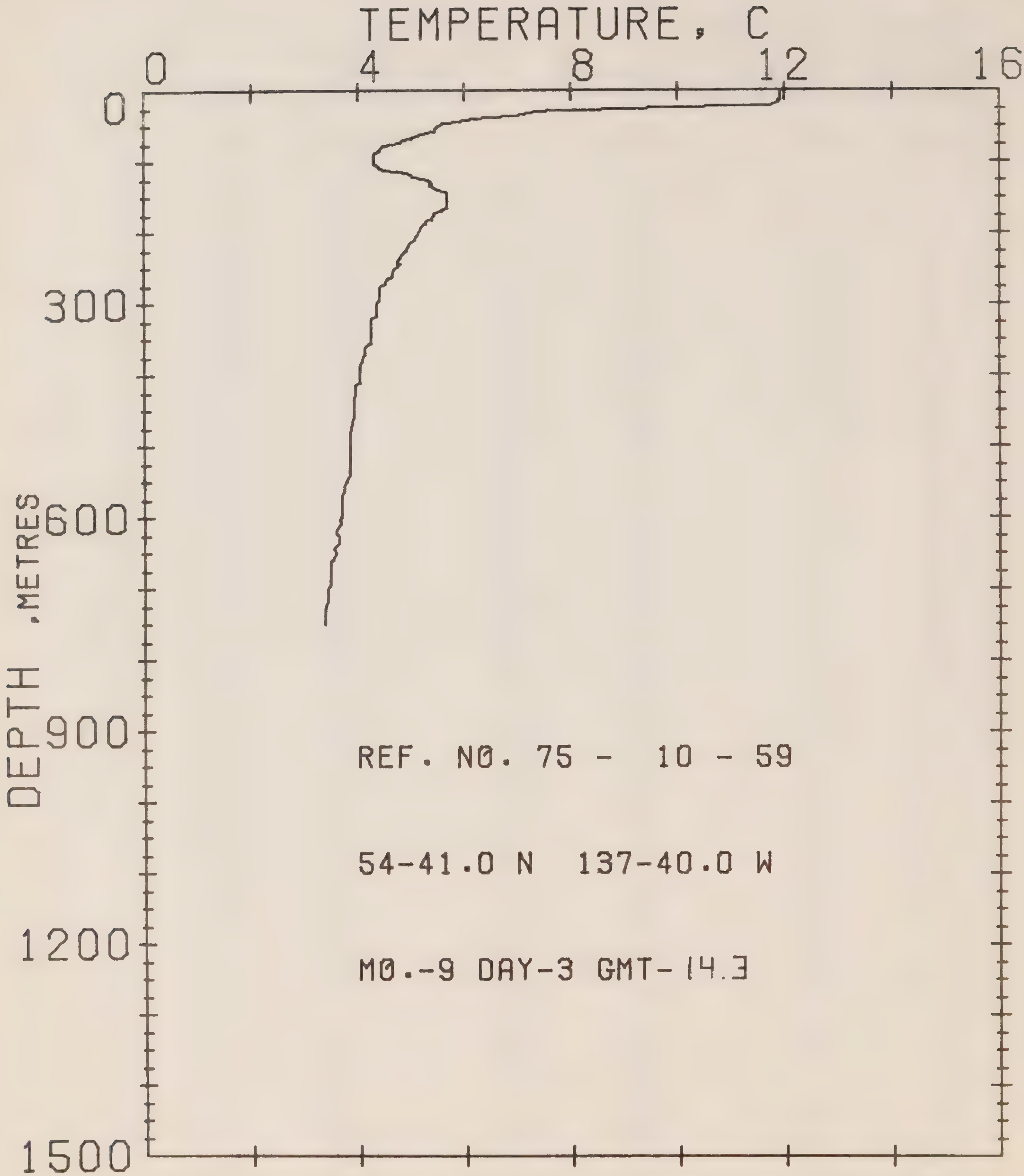
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 58
54-41.0 N 138-40.0 W
MO.-9 DAY-3 GMT-11.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 58 DATE 3/ 9/75
POSITION 54-41.0N 138-40.0W GMT 11.2
RESULTS OF XBT CAST 133 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.09	109	4.46	294	4.57
2	12.04	112	4.79	300	4.52
3	11.98	117	5.07	303	4.52
5	11.93	120	5.23	310	4.52
9	11.93	122	5.34	311	4.52
15	11.93	123	5.39	333	4.41
19	11.93	125	5.50	340	4.35
21	11.83	129	5.67	349	4.30
23	11.32	131	5.72	357	4.30
24	10.75	135	5.77	368	4.24
25	10.44	138	5.83	373	4.24
26	10.13	140	5.88	382	4.24
28	9.60	145	5.88	390	4.24
31	8.87	148	5.94	396	4.24
33	8.13	154	5.88	400	4.24
34	7.81	159	5.88	406	4.24
36	7.39	163	5.88	413	4.18
37	7.34	166	5.88	422	4.18
38	7.18	171	5.88	427	4.13
39	7.01	175	5.83	432	4.13
41	6.85	181	5.77	437	4.07
43	6.64	188	5.67	442	4.07
44	6.48	194	5.61	447	4.13
45	6.32	199	5.56	450	4.07
46	6.15	203	5.50	457	4.02
48	6.05	205	5.50	465	4.02
52	5.94	208	5.50	470	4.02
54	5.83	211	5.50	480	4.02
55	5.83	215	5.45	490	3.96
58	5.61	221	5.28	499	3.91
60	5.45	226	5.18	511	3.91
61	5.34	230	5.12	534	3.91
65	5.18	236	5.12	561	3.80
66	5.07	240	5.07	591	3.80
69	5.01	243	5.01	613	3.68
71	5.01	247	4.90	623	3.63
74	4.96	254	4.85	644	3.74
76	4.79	265	4.79	672	3.63
81	4.63	271	4.79	692	3.57
84	4.52	275	4.74	705	3.63
89	4.41	279	4.68	713	3.63
94	4.35	283	4.63	731	3.52
99	4.35	287	4.63	742	3.57
102	4.35	290	4.63	747	3.52
106	4.35				



TEMPERATURE, C
0
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1200
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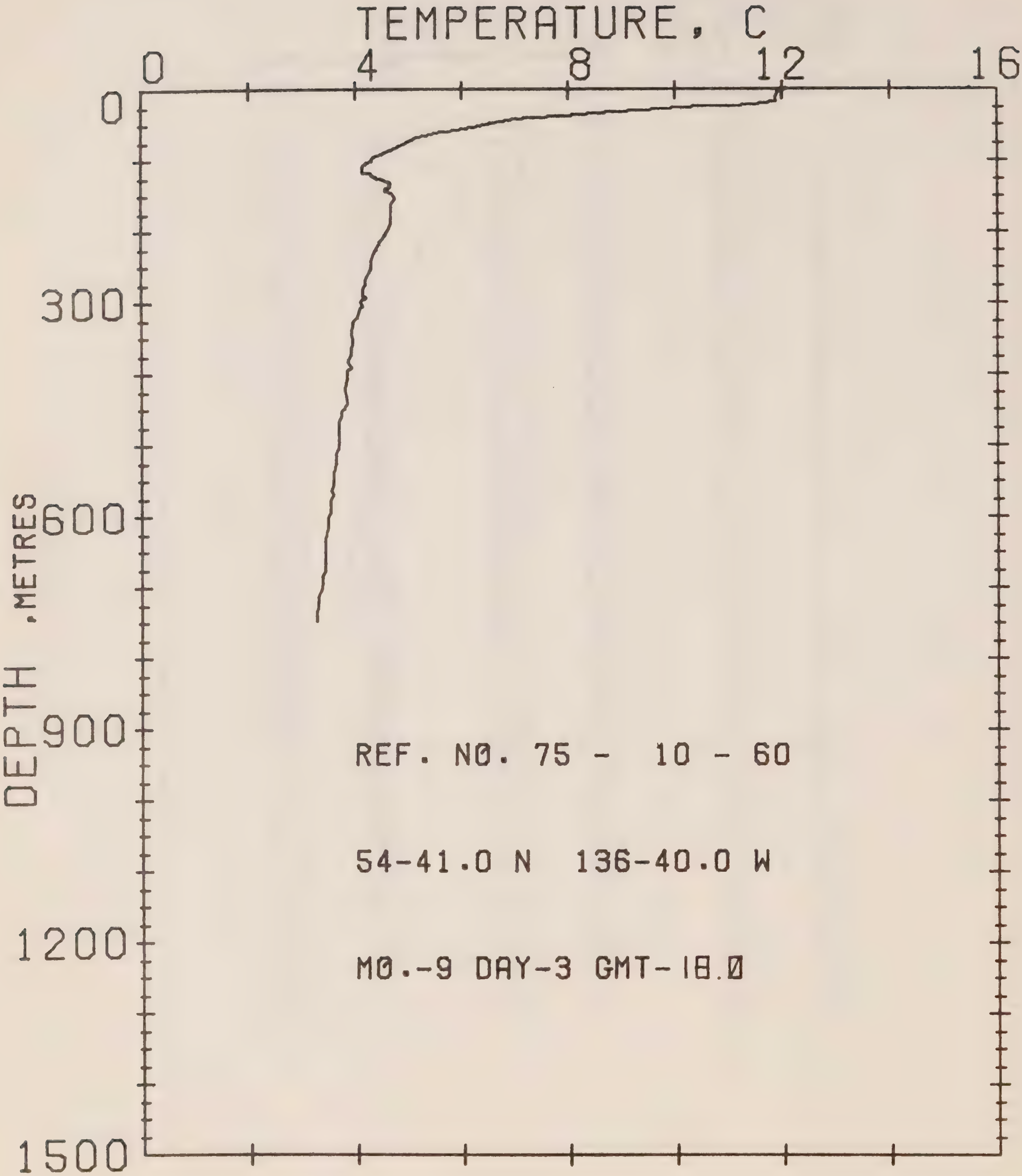
DEPTH ,METRES
REF. NO. 75 - 10 - 59
54-41.0 N 137-40.0 W
MO.-9 DAY-3 GMT-14.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 59 DATE 3/ 9/75
POSITION 54-41.0N 137-40.0W GMT 14.3
RESULTS OF XBT CAST 151 POINTS TAKEN FROM ANALOG TRACE

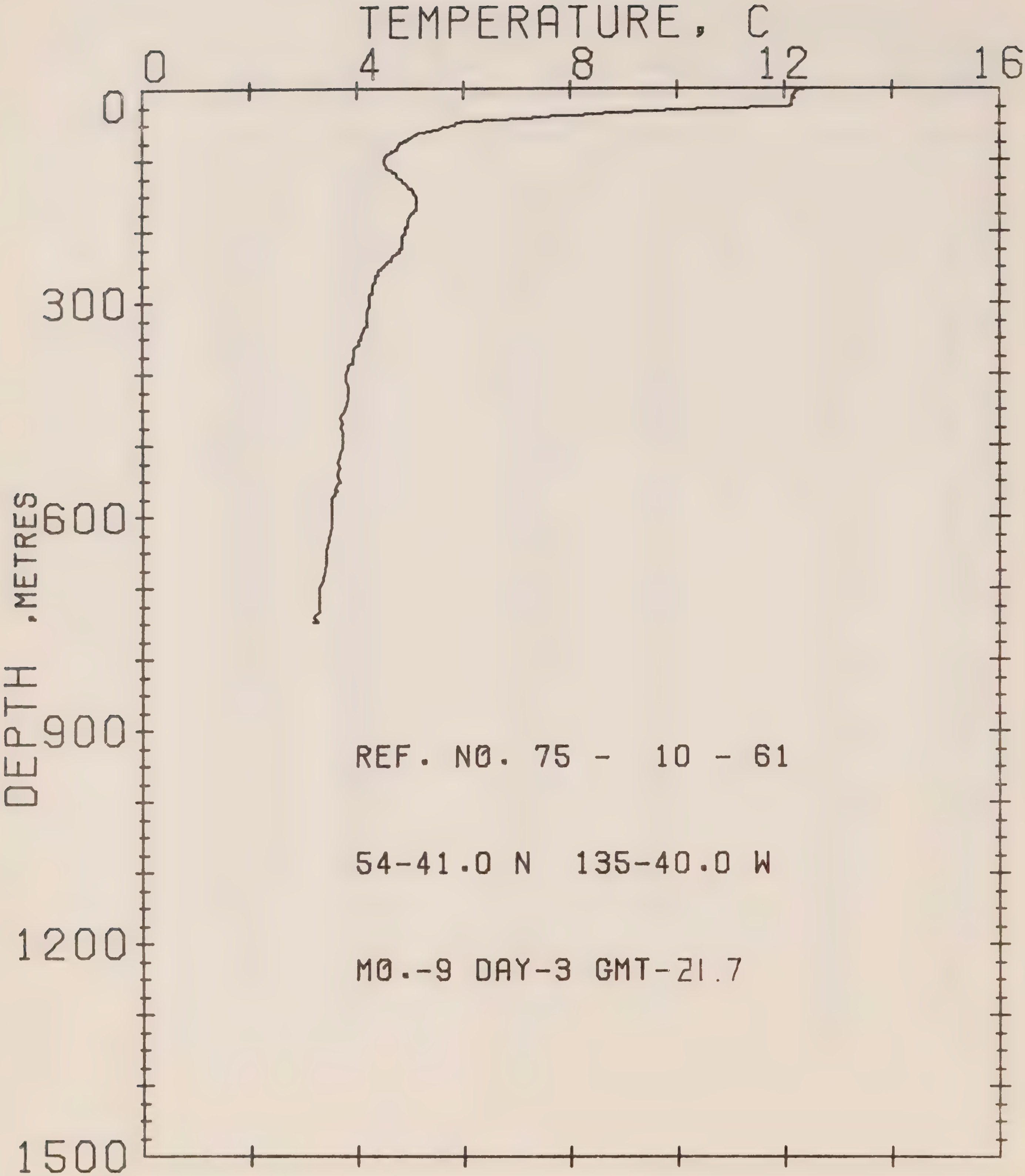
DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.04	128	5.34	355	4.24
1	11.93	130	5.39	358	4.18
8	11.93	132	5.39	362	4.13
13	11.93	134	5.34	369	4.13
16	11.88	136	5.39	373	4.13
18	11.88	138	5.45	377	4.07
21	11.73	140	5.50	382	4.07
22	11.06	142	5.56	387	4.02
24	9.92	144	5.67	401	4.02
26	8.98	147	5.67	412	4.02
28	8.24	152	5.67	415	3.96
29	7.76	157	5.67	422	3.96
31	7.39	163	5.67	424	3.96
33	7.23	166	5.67	435	3.91
34	7.12	168	5.61	460	3.91
35	7.01	170	5.56	481	3.85
36	6.80	172	5.45	499	3.85
37	6.64	175	5.45	516	3.85
38	6.48	179	5.39	540	3.85
40	6.21	182	5.39	551	3.80
42	6.05	185	5.28	557	3.74
43	5.99	187	5.28	561	3.74
44	5.94	190	5.23	571	3.68
46	5.61	195	5.18	586	3.68
49	5.56	203	5.12	600	3.68
52	5.50	210	5.07	604	3.63
56	5.45	218	4.96	608	3.68
57	5.45	225	4.90	617	3.57
60	5.28	230	4.85	623	3.57
64	5.12	236	4.79	627	3.63
67	5.01	241	4.74	635	3.63
70	4.85	243	4.74	645	3.52
74	4.79	245	4.79	649	3.57
75	4.63	248	4.74	660	3.52
79	4.52	253	4.68	663	3.46
80	4.46	258	4.63	669	3.46
85	4.41	261	4.63	678	3.46
90	4.30	262	4.63	682	3.46
95	4.30	266	4.57	690	3.46
99	4.30	273	4.52	696	3.46
103	4.30	278	4.41	702	3.41
106	4.35	282	4.41	707	3.41
109	4.41	290	4.41	718	3.41
112	4.46	296	4.41	725	3.35
114	4.74	300	4.35	731	3.35
116	4.85	307	4.35	737	3.35
118	4.96	318	4.35	741	3.35
120	5.01	323	4.24	746	3.35
122	5.01	333	4.24	748	3.35
124	5.18	343	4.24	749	3.35
127	5.28				



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 60
54-41.0 N 136-40.0 W
MO.-9 DAY-3 GMT-18.0

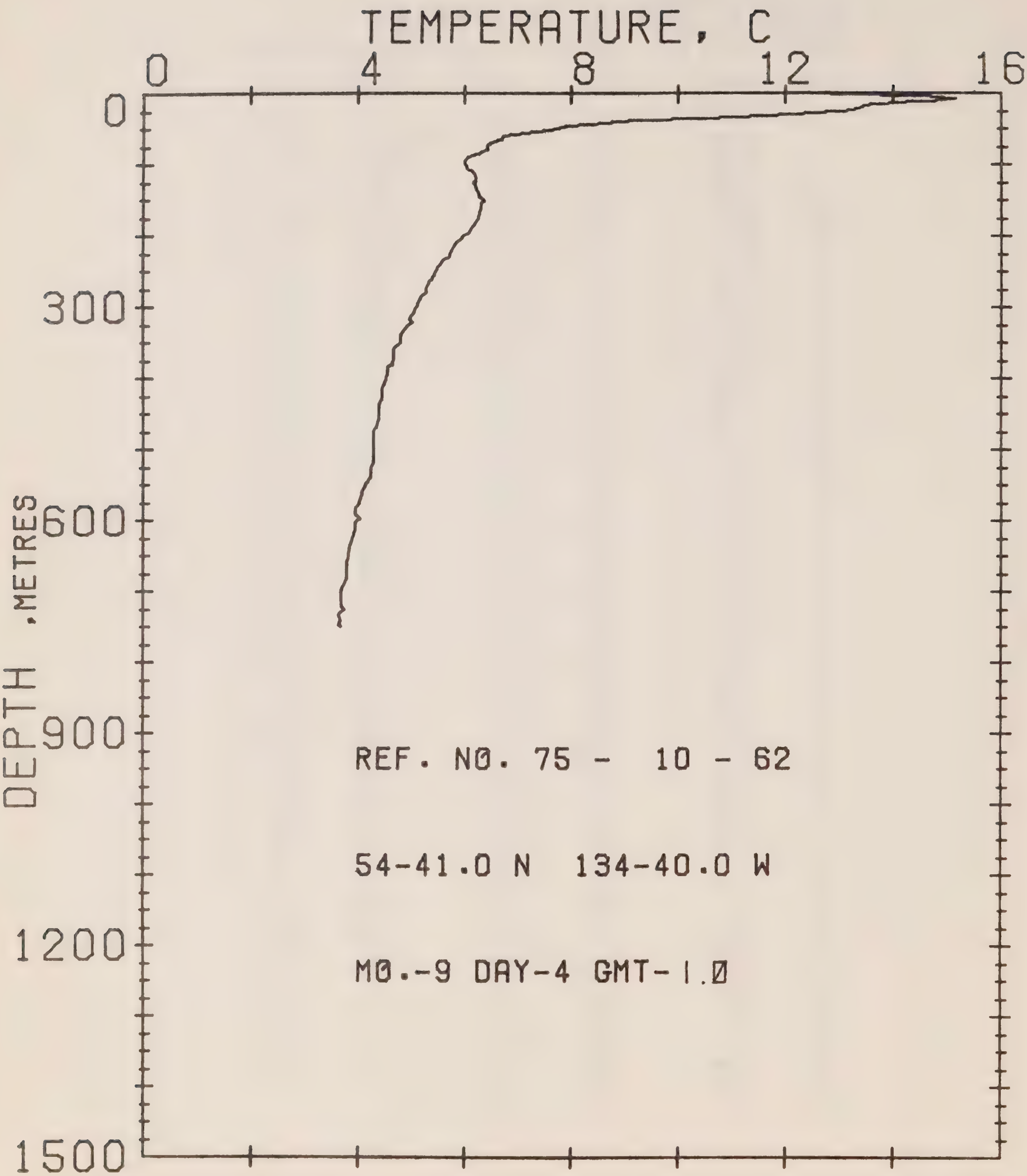
OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 30 DATE 3/ 9/75
POSITION 54-41.0N 130-40.0W GMT 18.0
RESULTS OF XBT CAST 109 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.09	144	4.57	424	3.80
5	11.93	145	4.63	440	3.85
11	11.88	147	4.68	445	3.85
18	11.88	154	4.74	449	3.80
22	11.42	162	4.68	454	3.74
23	11.06	172	4.68	460	3.74
24	10.49	187	4.68	468	3.68
28	9.76	196	4.63	486	3.68
34	8.50	205	4.57	505	3.68
37	7.92	215	4.46	513	3.63
39	7.34	226	4.41	525	3.63
41	7.01	232	4.35	540	3.57
44	6.91	243	4.30	557	3.57
49	6.59	254	4.30	565	3.52
54	6.21	268	4.18	571	3.57
59	5.72	274	4.18	579	3.52
61	5.61	275	4.18	586	3.52
65	5.45	282	4.13	596	3.52
68	5.16	292	4.13	603	3.46
81	4.79	295	4.18	607	3.46
97	4.35	300	4.07	616	3.46
102	4.30	305	4.13	631	3.41
107	4.18	310	4.07	640	3.41
111	4.13	323	4.02	648	3.41
116	4.13	327	3.96	656	3.41
117	4.13	334	3.96	667	3.41
118	4.24	340	3.91	669	3.41
120	4.30	347	3.91	675	3.41
122	4.30	355	3.96	685	3.35
123	4.35	359	3.96	699	3.35
125	4.41	365	3.91	714	3.29
128	4.52	374	3.91	729	3.29
131	4.63	385	3.85	736	3.24
134	4.68	392	3.91	742	3.24
135	4.63	397	3.85	746	3.24
138	4.63	406	3.85	748	3.24
142	4.57				


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 61
54-41.0 N 135-40.0 W
MO.-9 DAY-3 GMT-21.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 61 DATE 3/ 9/75
POSITION 54-41.0N 135-40.0W GMT 21.7
RESULTS OF XBT CAST 167 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.34	139	4.96	352	4.07
4	12.24	141	5.01	354	4.02
7	12.19	146	5.07	357	4.02
9	12.19	149	5.07	360	4.02
11	12.14	151	5.12	367	3.96
13	12.19	154	5.12	370	3.96
15	12.14	156	5.12	375	3.96
18	12.14	160	5.12	379	3.91
21	12.14	162	5.12	382	3.91
23	12.14	167	5.12	386	3.91
25	12.09	170	5.12	388	3.85
26	11.88	174	5.07	394	3.85
27	11.57	178	5.01	399	3.80
28	11.11	184	4.96	404	3.80
29	10.70	189	4.96	413	3.80
30	10.02	194	4.96	417	3.85
31	9.86	197	4.90	421	3.85
32	9.76	203	4.90	434	3.85
33	9.45	208	4.85	451	3.80
34	8.87	212	4.85	461	3.68
36	8.40	217	4.85	471	3.74
37	8.13	221	4.85	475	3.68
38	7.87	224	4.85	482	3.74
40	7.44	226	4.79	489	3.74
41	7.18	230	4.79	493	3.74
42	7.07	232	4.74	504	3.74
43	6.96	236	4.68	513	3.68
44	6.80	242	4.63	518	3.68
45	6.64	244	4.57	523	3.63
46	6.10	246	4.57	525	3.63
47	5.99	250	4.52	532	3.68
48	5.94	254	4.46	538	3.63
49	5.88	256	4.41	545	3.63
52	5.83	258	4.41	552	3.68
54	5.67	261	4.41	556	3.63
56	5.56	263	4.35	561	3.57
59	5.39	267	4.35	565	3.63
62	5.23	272	4.35	569	3.57
65	5.12	276	4.30	571	3.57
71	4.96	280	4.30	574	3.52
74	4.90	286	4.30	580	3.52
78	4.79	287	4.30	584	3.52
85	4.74	290	4.24	587	3.52
90	4.63	291	4.24	602	3.52
94	4.57	294	4.24	615	3.52
99	4.52	298	4.24	631	3.46
102	4.52	301	4.24	647	3.41
107	4.52	306	4.24	665	3.41
113	4.57	311	4.18	687	3.35
117	4.68	318	4.18	703	3.29
121	4.74	322	4.18	719	3.29
124	4.74	325	4.18	734	3.29
129	4.85	329	4.18	742	3.18
131	4.85	333	4.18	747	3.24
134	4.90	339	4.13	748	3.18
137	4.96	346	4.07		


TEMPERATURE, C
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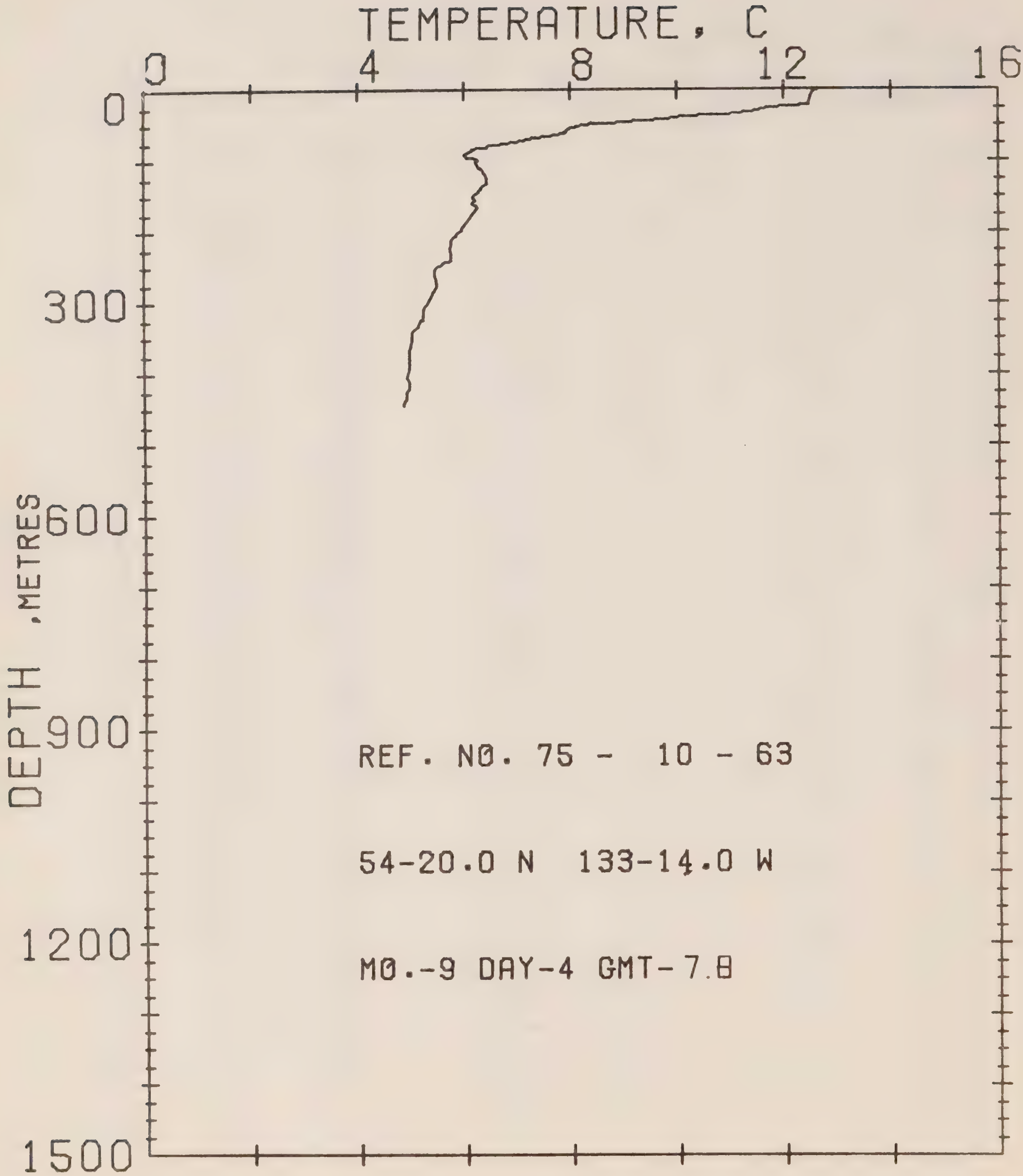
DEPTH .METRES
REF. NO. 75 - 10 - 62
54-41.0 N 134-40.0 W
MO.-9 DAY-4 GMT-1.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 02   DATE 4/ 9/75
POSITION   54-41.0N   134-40.0W   GMT 1.0
RESULTS OF XBT CAST   116 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.75	117	6.21	408	4.52
2	12.86	123	6.21	415	4.46
4	14.64	126	6.15	422	4.46
6	14.69	131	6.21	429	4.46
7	15.15	136	6.21	435	4.41
8	15.10	142	6.26	442	4.41
10	14.89	145	6.26	448	4.41
11	14.74	146	6.26	459	4.41
12	14.38	148	6.32	470	4.35
14	14.06	151	6.37	473	4.30
16	13.77	156	6.32	484	4.30
17	13.57	163	6.32	498	4.30
20	13.42	175	6.26	510	4.30
25	13.11	194	6.10	518	4.30
27	12.91	204	5.94	528	4.24
29	12.55	212	5.83	540	4.24
33	11.62	222	5.77	546	4.18
35	10.44	227	5.72	552	4.13
36	9.24	237	5.56	561	4.07
41	8.61	247	5.50	565	4.07
45	8.40	255	5.45	577	4.02
46	7.92	261	5.39	584	3.96
50	7.75	267	5.34	592	3.96
52	7.65	276	5.28	597	4.02
53	7.34	280	5.28	604	3.96
57	6.96	289	5.18	612	3.96
61	6.75	298	5.12	620	3.91
66	6.69	307	5.07	638	3.85
69	6.59	318	4.96	662	3.80
72	6.48	323	5.01	683	3.80
74	6.42	330	4.90	697	3.68
80	6.42	340	4.79	712	3.68
84	6.32	349	4.79	722	3.68
88	6.15	360	4.68	726	3.74
92	6.05	368	4.63	734	3.63
96	5.99	373	4.68	742	3.68
100	5.99	381	4.63	747	3.63
107	6.05	383	4.57	749	3.68
113	6.15	395	4.57		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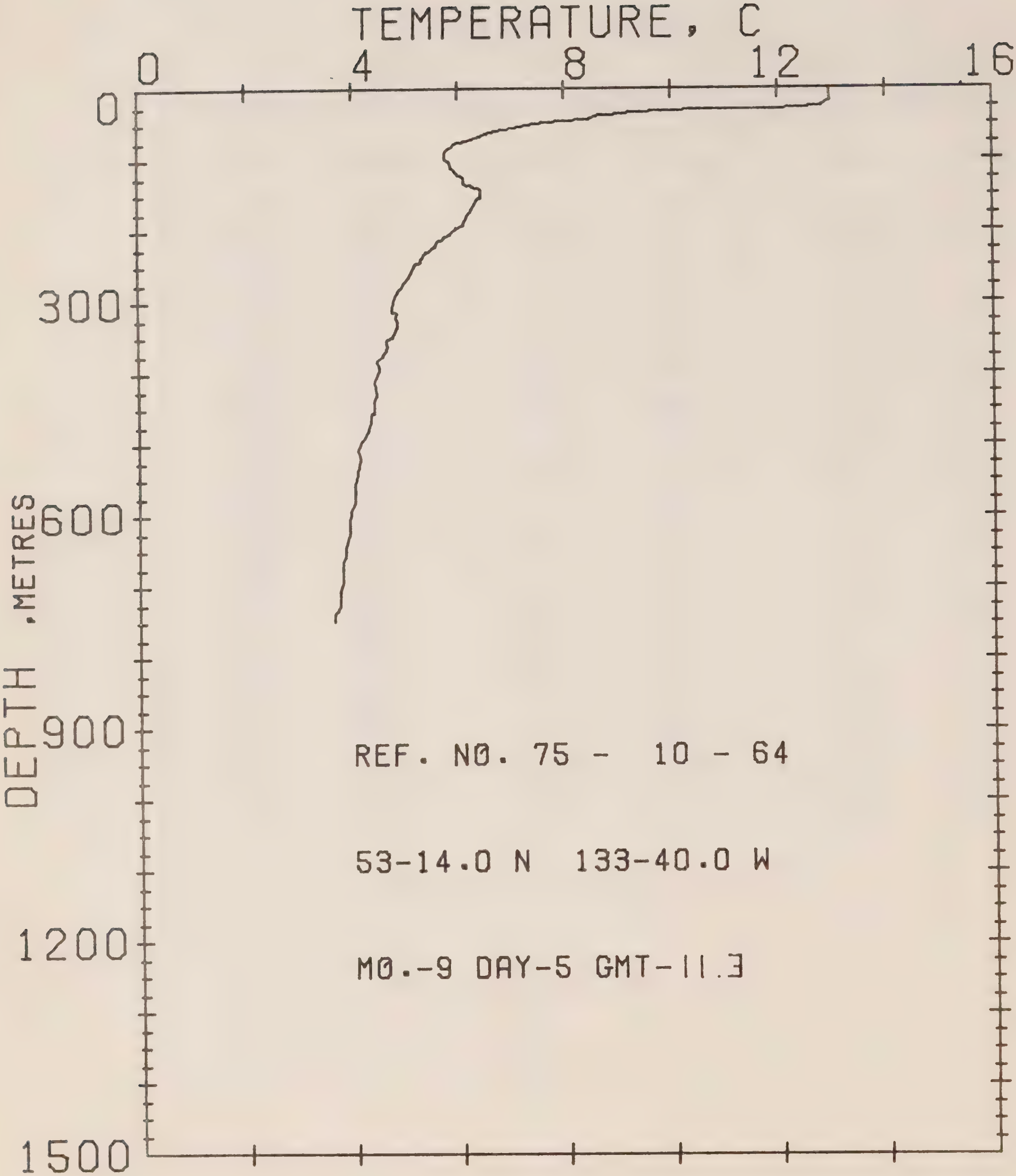
DEPTH ,METRES
REF. NO. 75 - 10 - 63
54-20.0 N 133-14.0 W
MO.-9 DAY-4 GMT-7.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 63 DATE 4/ 9/75
POSITION 54-20.0N 133-14.0W GMT 7.8
RESULTS OF XBT CAST 79 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.65	81	6.42	224	5.72
2	12.60	83	6.32	232	5.77
4	12.55	84	6.15	236	5.77
10	12.50	87	6.15	241	5.77
21	12.45	93	5.99	243	5.61
24	12.14	95	6.05	253	5.45
27	11.68	96	6.15	261	5.45
31	11.52	99	6.26	275	5.50
35	10.90	102	6.21	285	5.45
36	10.64	109	6.26	298	5.34
38	10.13	113	6.32	309	5.23
42	9.81	117	6.37	324	5.23
45	9.39	123	6.42	326	5.18
47	8.95	132	6.42	333	5.12
48	8.77	140	6.32	342	5.01
49	8.45	144	6.26	354	5.01
52	8.13	152	6.15	369	4.96
56	7.97	157	6.21	382	4.96
59	7.92	160	6.15	395	4.96
62	7.87	166	6.26	405	4.90
66	7.60	176	6.15	412	4.96
68	7.34	192	5.99	422	4.96
72	7.12	199	5.94	427	4.90
74	6.96	207	5.83	435	4.90
76	6.80	213	5.77	441	4.85
77	6.59	217	5.77	445	4.85
79	6.48				


TEMPERATURE, C
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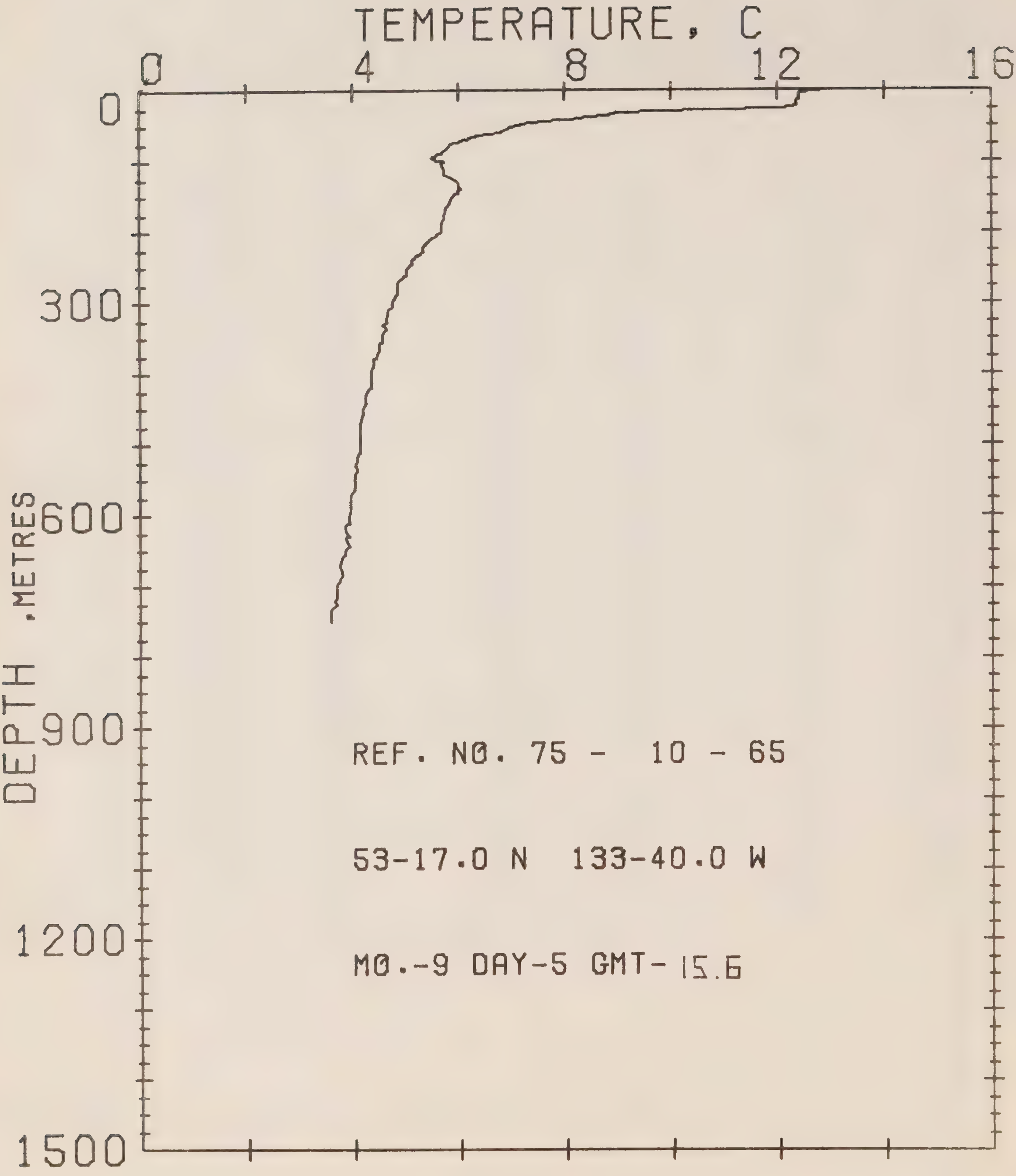
DEPTH ,METRES
REF. NO. 75 - 10 - 64
53-14.0 N 133-40.0 W
MO.-9 DAY-5 GMT-11.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 64 DATE 5/ 9/75
POSITION 53-14.0N 133-40.0W GMT 11.3
RESULTS OF XBT CAST 94 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	12.96	183	6.15	397	4.52
10	12.96	192	6.10	411	4.41
19	12.96	198	5.94	431	4.46
25	12.80	205	5.83	437	4.41
30	11.93	210	5.72	456	4.41
31	10.54	218	5.61	459	4.35
34	9.29	221	5.56	466	4.35
35	9.08	231	5.39	468	4.35
37	8.82	238	5.34	479	4.30
38	8.66	244	5.28	487	4.24
44	8.45	249	5.18	501	4.13
47	7.97	258	5.12	508	4.07
50	7.44	266	5.07	521	4.13
54	7.18	276	4.96	540	4.07
58	6.91	287	4.85	558	4.02
61	6.69	295	4.79	580	4.02
65	6.53	308	4.74	593	3.96
71	6.26	314	4.74	611	3.91
76	5.94	317	4.85	625	3.91
90	5.77	322	4.79	643	3.85
99	5.77	328	4.85	658	3.85
104	5.83	336	4.85	665	3.80
113	5.88	349	4.74	677	3.80
117	5.94	354	4.63	694	3.80
122	5.99	359	4.63	707	3.74
125	6.10	362	4.68	717	3.74
134	6.10	365	4.63	725	3.74
136	6.26	369	4.63	734	3.68
142	6.42	375	4.57	739	3.63
153	6.42	385	4.46	745	3.63
157	6.37	392	4.52	747	3.63
171	6.26				


TEMPERATURE, C
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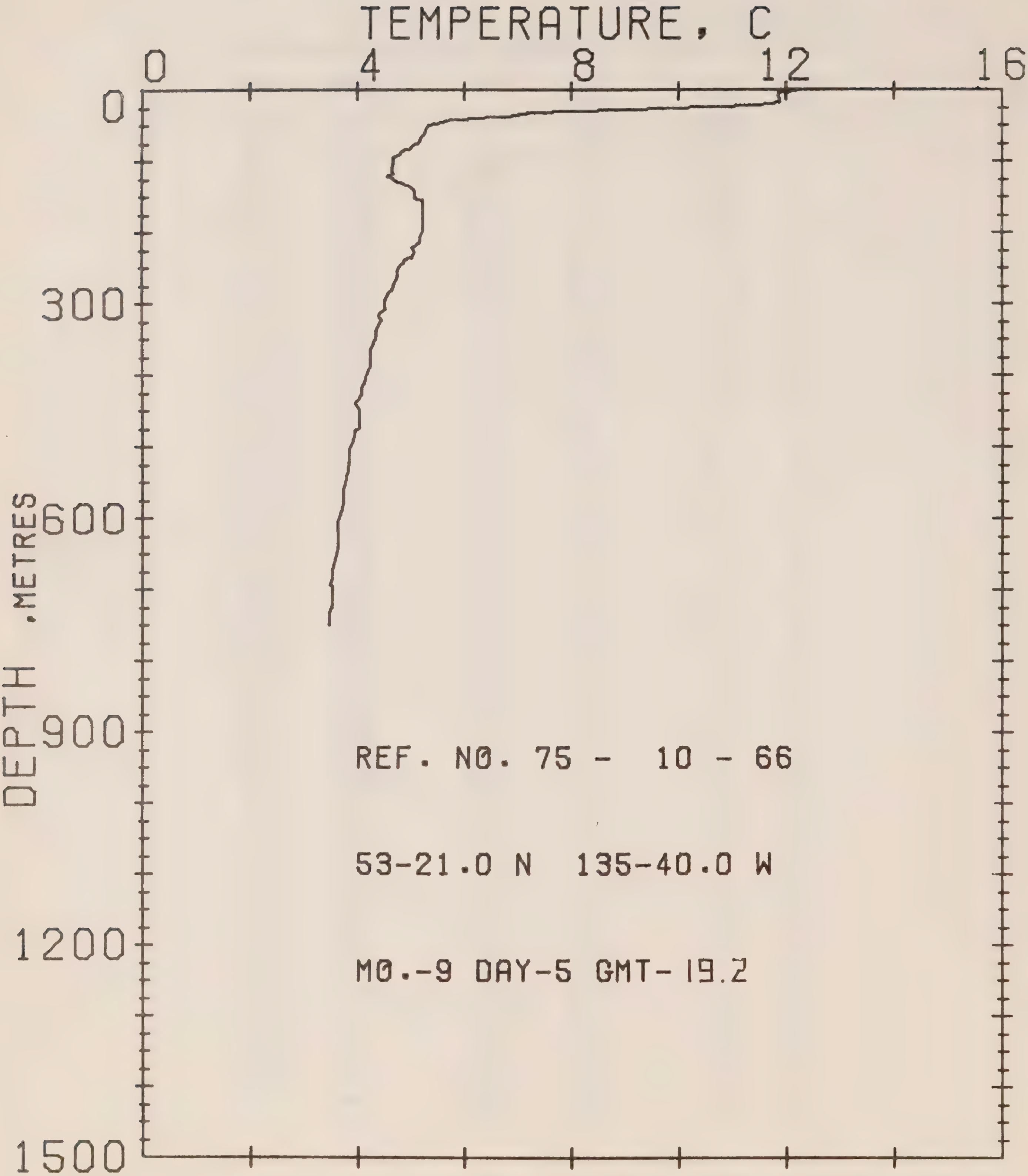
DEPTH ,METRES
REF. NO. 75 - 10 - 65
53-17.0 N 133-40.0 W
MO.-9 DAY-5 GMT- 15.6

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 65 DATE 5/ 9/75
POSITION 53-17.0N 133-40.0W GMT 15.6
RESULTS OF XBT CAST 170 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.80	139	6.05	391	4.41
2	12.65	142	5.99	396	4.35
3	12.50	143	5.99	401	4.35
5	12.45	145	5.99	406	4.35
6	12.40	147	5.94	409	4.35
9	12.40	153	5.88	413	4.35
12	12.40	160	5.83	421	4.35
13	12.40	168	5.77	424	4.30
16	12.34	180	5.72	429	4.24
19	12.34	191	5.67	435	4.24
21	12.34	196	5.67	441	4.24
25	12.14	200	5.67	450	4.18
27	11.62	204	5.61	459	4.18
28	11.21	207	5.56	472	4.13
29	10.59	210	5.50	483	4.13
30	9.86	214	5.45	493	4.13
31	9.66	219	5.39	501	4.13
32	9.19	223	5.34	507	4.13
33	8.98	226	5.34	513	4.13
35	8.82	228	5.34	518	4.07
38	8.45	232	5.28	524	4.07
41	8.13	235	5.23	530	4.02
42	7.92	238	5.18	536	4.07
46	7.39	241	5.12	544	4.02
48	7.23	244	5.12	549	4.02
50	7.18	247	5.12	557	4.02
52	7.01	250	5.07	565	4.02
54	6.96	254	5.01	572	3.96
59	6.80	261	5.01	579	3.96
62	6.59	264	4.96	590	3.96
65	6.37	271	4.85	604	3.91
66	6.32	278	4.85	612	3.91
68	6.21	282	4.85	615	3.85
71	6.05	287	4.85	622	3.85
73	6.05	293	4.79	629	3.91
75	5.88	301	4.74	632	3.85
79	5.83	307	4.74	644	3.91
90	5.67	310	4.68	649	3.85
91	5.67	316	4.68	655	3.85
92	5.56	320	4.63	660	3.80
95	5.50	325	4.63	672	3.74
97	5.50	327	4.63	679	3.80
99	5.56	332	4.57	684	3.80
100	5.67	337	4.63	693	3.74
102	5.72	343	4.57	698	3.68
104	5.67	346	4.57	705	3.68
108	5.67	352	4.57	709	3.68
112	5.72	355	4.57	714	3.68
114	5.72	356	4.57	717	3.68
117	5.72	358	4.52	722	3.63
119	5.72	362	4.52	727	3.68
121	5.72	367	4.52	734	3.57
123	5.83	375	4.46	738	3.57
124	5.88	377	4.46	742	3.57
128	5.94	379	4.41	747	3.57
131	5.99	382	4.41	749	3.57
137	5.99	385	4.41		


TEMPERATURE, C
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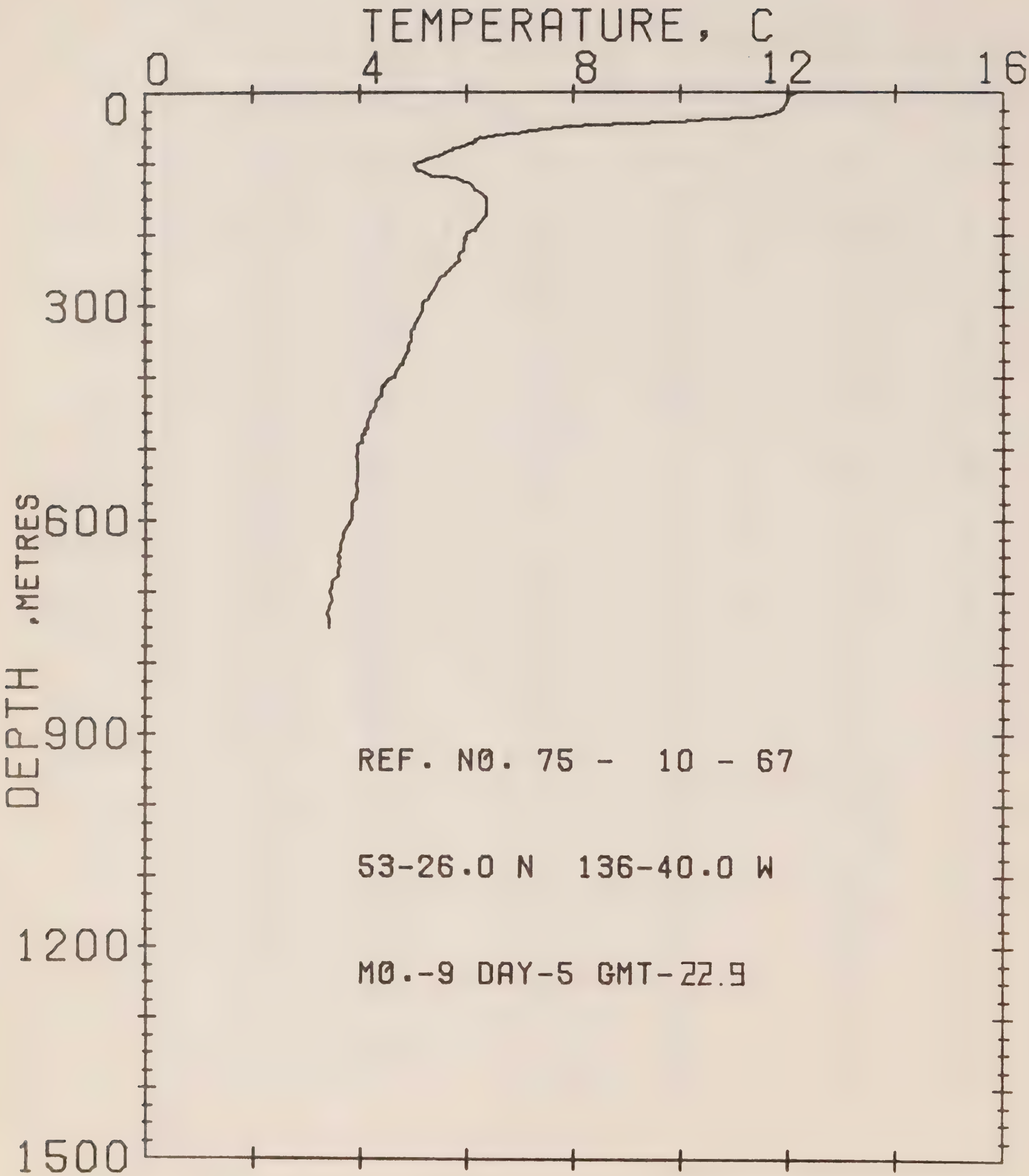
DEPTH ,METRES
REF. NO. 75 - 10 - 66
53-21.0 N 135-40.0 W
MO.-9 DAY-5 GMT- 19.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 06 DATE 5/ 9/75
POSITION 53-21.0N 135-40.0W GMT 19.2
RESULTS OF XBT CAST 113 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.19	133	4.85	380	4.24
3	12.04	137	5.01	387	4.24
5	11.88	142	5.07	396	4.18
8	11.83	147	5.07	412	4.13
11	11.88	151	5.07	419	4.07
14	11.88	153	5.12	428	4.07
16	11.88	154	5.23	440	3.96
18	11.88	159	5.23	447	4.02
22	11.47	167	5.23	455	4.02
24	10.59	174	5.23	460	4.02
29	9.03	183	5.23	465	4.02
30	8.03	193	5.23	474	4.02
33	7.34	199	5.23	478	3.96
34	7.01	205	5.18	485	3.96
36	7.01	214	5.18	492	3.91
37	6.75	221	5.01	504	3.85
38	6.53	228	5.07	522	3.85
39	6.26	236	5.01	545	3.80
41	5.86	239	4.90	561	3.74
42	5.72	244	4.85	578	3.74
46	5.61	248	4.79	594	3.68
51	5.34	253	4.74	607	3.63
60	5.28	261	4.74	618	3.63
72	5.18	275	4.68	630	3.63
81	5.01	282	4.63	642	3.63
86	4.85	288	4.57	658	3.57
89	4.79	297	4.52	673	3.52
95	4.68	308	4.52	687	3.52
100	4.68	315	4.41	693	3.46
104	4.68	320	4.41	696	3.52
109	4.63	324	4.46	707	3.52
111	4.63	330	4.41	720	3.52
115	4.63	338	4.35	727	3.52
119	4.68	343	4.35	733	3.46
122	4.57	350	4.35	741	3.46
124	4.63	357	4.30	746	3.46
127	4.68	366	4.24	749	3.46
130	4.74	370	4.24		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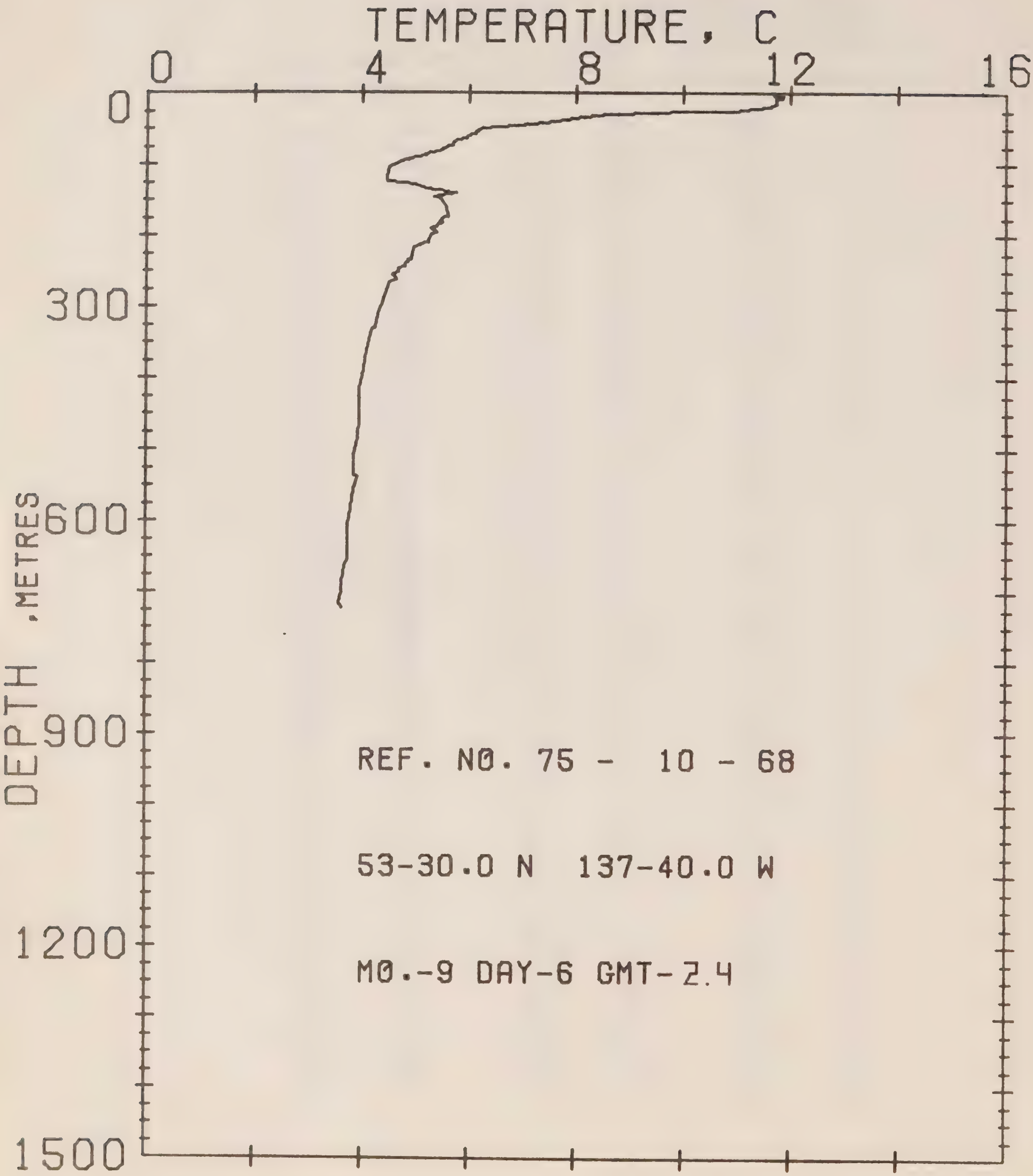
DEPTH ,METRES
REF. NO. 75 - 10 - 67
53-26.0 N 136-40.0 W
MO.-9 DAY-5 GMT-22.9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 67 DATE 5/ 9/75
POSITION 53-26.0N 136-40.0W GMT 22.9
RESULTS OF XBT CAST 166 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.14	132	6.10	421	4.41
4	12.09	138	6.15	425	4.41
9	12.04	142	6.26	430	4.35
15	11.98	146	6.32	434	4.30
19	11.98	149	6.37	440	4.30
24	11.93	155	6.37	447	4.24
27	11.88	163	6.37	449	4.18
30	11.78	168	6.37	455	4.18
33	11.62	174	6.37	461	4.13
35	11.32	178	6.32	467	4.13
36	11.11	188	6.21	472	4.13
37	10.80	194	6.15	474	4.07
38	10.59	197	6.05	479	4.07
40	10.23	198	5.99	483	4.02
41	9.97	202	5.99	486	4.02
43	9.66	205	5.94	488	4.02
44	9.29	207	5.99	491	4.02
45	9.03	211	5.94	495	3.96
46	8.45	216	5.94	497	3.96
47	8.29	221	5.94	503	3.96
48	8.13	226	5.88	505	3.96
49	7.92	232	5.83	510	3.91
52	7.50	236	5.88	518	3.96
55	7.23	244	5.77	524	3.96
56	7.12	250	5.67	529	3.96
57	6.96	257	5.61	535	3.96
58	6.91	262	5.50	543	3.96
61	6.59	270	5.45	550	3.91
63	6.32	277	5.39	560	3.96
66	6.15	284	5.34	565	3.91
68	6.15	291	5.28	570	3.91
70	6.15	297	5.18	577	3.85
72	6.10	303	5.18	586	3.85
74	5.99	307	5.18	597	3.85
77	5.88	314	5.12	606	3.80
79	5.77	321	5.07	611	3.74
82	5.72	327	5.01	619	3.68
84	5.61	331	5.01	624	3.68
86	5.61	336	4.96	631	3.63
87	5.56	340	4.96	640	3.63
90	5.50	344	4.96	649	3.57
93	5.34	349	4.96	653	3.63
94	5.28	355	4.90	658	3.57
99	5.07	360	4.90	665	3.63
100	5.01	363	4.90	670	3.57
104	5.01	371	4.85	678	3.57
109	5.07	377	4.79	685	3.46
111	5.12	381	4.79	693	3.46
114	5.23	385	4.74	701	3.41
117	5.34	392	4.68	713	3.46
118	5.45	399	4.63	722	3.41
119	5.56	402	4.57	732	3.35
121	5.72	406	4.52	738	3.41
122	5.83	411	4.46	744	3.41
125	5.94	415	4.41	749	3.41
128	6.05				



TEMPERATURE, C
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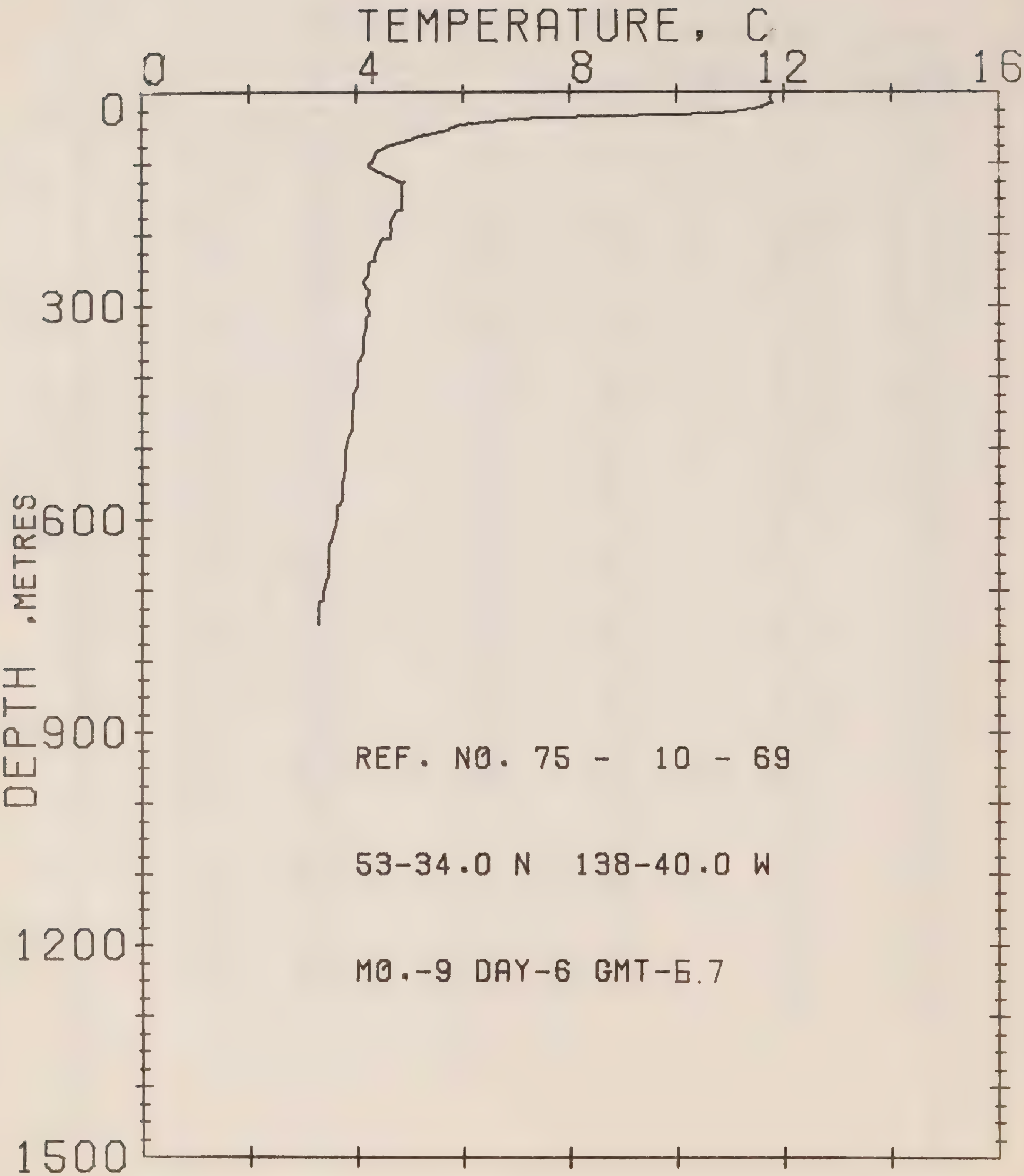
DEPTH ,METRES
REF. NO. 75 - 10 - 68
53-30.0 N 137-40.0 W
MO.-9 DAY-6 GMT-2.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 68 DATE 6/ 9/75
POSITION 53-30.0N 137-40.0W GMT 2.4
RESULTS OF XBT CAST 103 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.68	119	4.46	235	4.85
3	11.68	123	4.46	238	4.85
5	11.88	124	4.52	241	4.79
8	11.83	127	4.74	243	4.79
9	11.73	128	4.96	247	4.68
16	11.73	135	5.18	252	4.68
20	11.62	137	5.61	257	4.57
21	11.32	139	5.61	262	4.63
24	11.16	140	5.77	265	4.52
26	10.90	145	5.34	291	4.41
27	10.02	146	5.39	313	4.30
29	9.50	148	5.45	330	4.24
31	8.61	151	5.50	332	4.18
34	8.13	160	5.56	362	4.07
40	7.65	161	5.56	388	4.02
41	7.39	162	5.56	416	3.96
44	7.23	164	5.56	440	3.96
50	6.26	166	5.56	459	3.96
51	6.26	167	5.61	484	3.91
53	6.15	170	5.61	508	3.85
58	6.10	173	5.61	535	3.85
60	5.99	175	5.50	538	3.91
65	5.94	178	5.50	555	3.85
66	5.83	181	5.45	562	3.80
69	5.72	183	5.50	606	3.74
74	5.67	187	5.39	641	3.74
76	5.56	191	5.28	654	3.74
80	5.50	195	5.39	665	3.68
84	5.34	200	5.23	685	3.63
87	5.18	209	5.23	697	3.63
88	5.13	211	5.12	700	3.63
92	4.90	214	5.07	716	3.57
94	4.85	219	4.96	719	3.57
95	4.74	234	4.90	722	3.63
104	4.52				


TEMPERATURE, C
0
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16
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300
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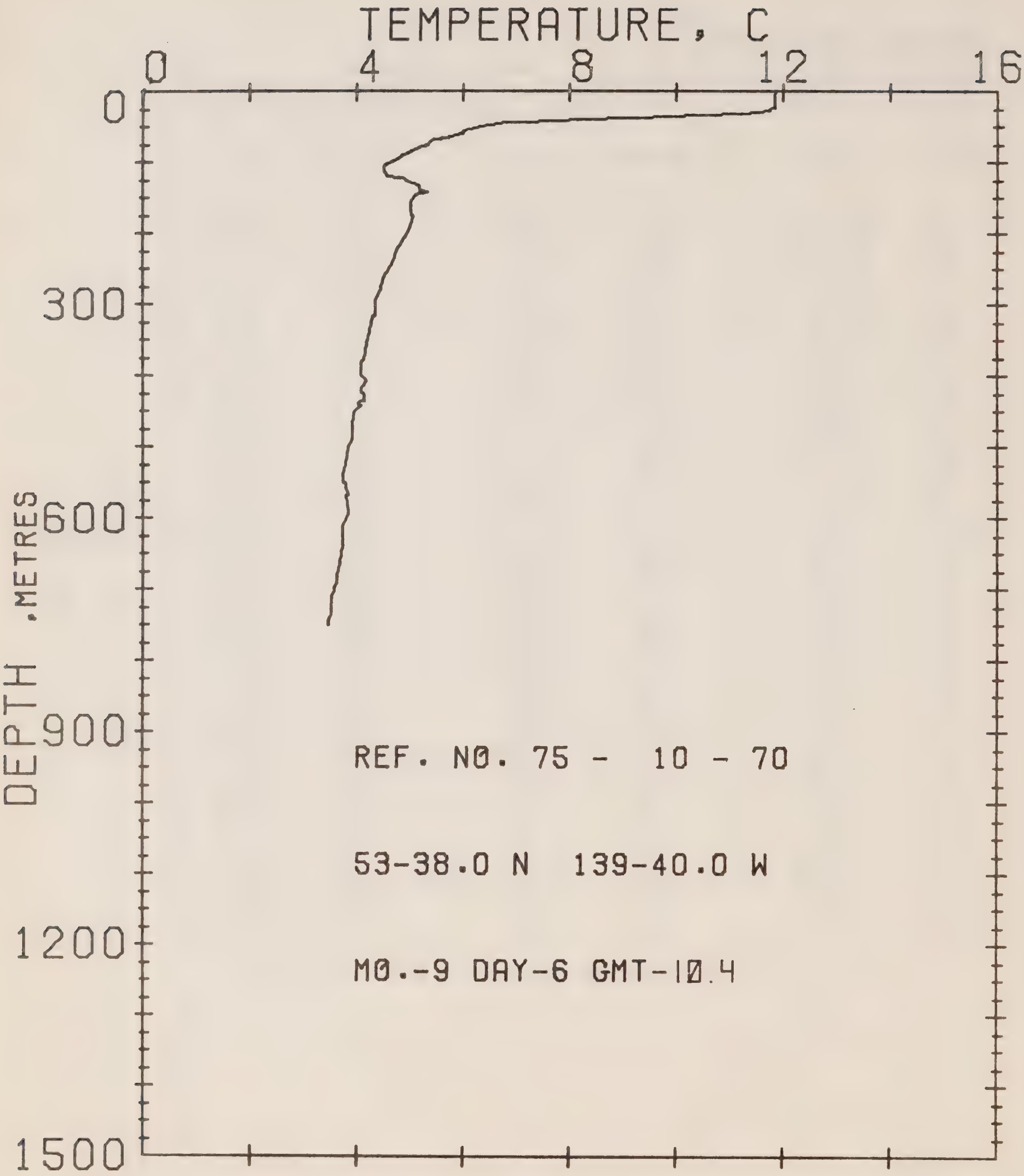
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 69
53-34.0 N 138-40.0 W
MO.-9 DAY-6 GMT-6.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 69   DATE 6/ 9/75
POSITION 53-34.0N 138-40.0W   GMT 6.7
RESULTS OF XBT CAST   95 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.78	129	4.85	376	4.07
8	11.73	144	4.85	380	4.02
16	11.78	151	4.85	393	4.02
18	11.68	159	4.85	411	4.02
22	11.57	165	4.85	424	3.96
26	11.26	167	4.74	439	3.96
30	10.75	182	4.68	456	3.91
32	9.81	184	4.63	474	3.91
36	7.60	189	4.63	489	3.85
38	6.96	192	4.68	506	3.80
41	6.48	200	4.63	517	3.80
44	6.15	206	4.63	528	3.80
49	5.83	207	4.52	550	3.74
53	5.72	213	4.46	572	3.74
56	5.61	222	4.41	579	3.68
59	5.34	228	4.35	580	3.63
61	5.26	237	4.35	597	3.63
64	5.12	240	4.24	619	3.57
66	5.07	255	4.24	632	3.52
70	4.96	269	4.13	638	3.46
74	4.68	275	4.18	648	3.46
76	4.57	279	4.24	659	3.46
84	4.41	265	4.24	671	3.46
91	4.35	294	4.18	682	3.46
99	4.30	300	4.18	687	3.41
101	4.24	308	4.24	705	3.35
106	4.24	311	4.24	714	3.35
110	4.35	314	4.24	718	3.29
116	4.52	318	4.13	730	3.29
121	4.68	332	4.18	741	3.29
125	4.79	347	4.13	747	3.29
127	4.96	365	4.13		


TEMPERATURE, C
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300
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900
1200
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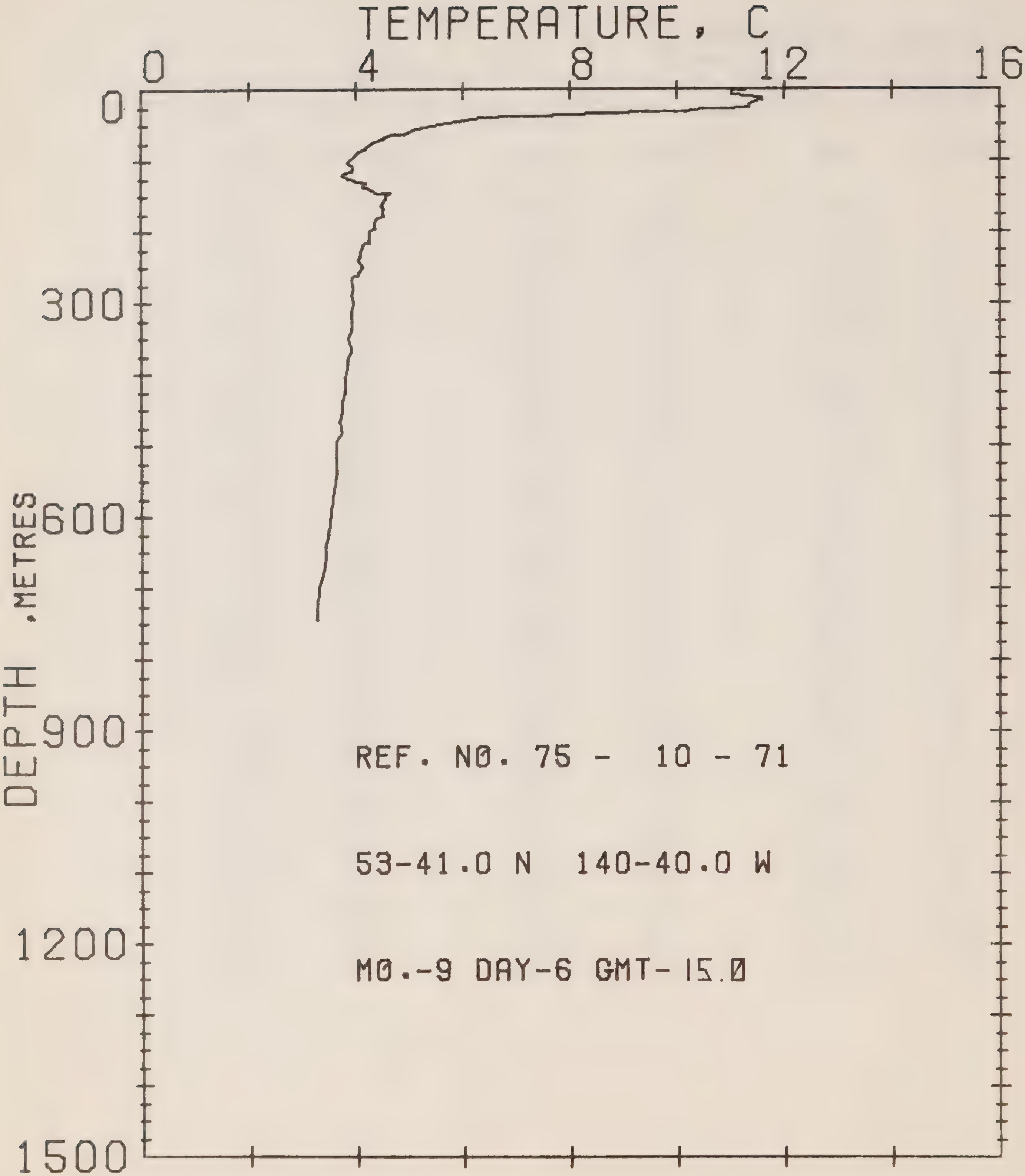
DEPTH .METRES
REF. NO. 75 - 10 - 70
53-38.0 N 139-40.0 W
MO.-9 DAY-6 GMT-10.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 70 DATE 6/ 9/75
POSITION 53-38.0N 139-40.0W GMT 10.4
RESULTS OF XBT CAST 99 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.68	120	4.57	418	4.07
6	11.83	122	4.79	423	4.07
16	11.83	123	4.90	426	4.13
24	11.83	127	4.90	435	4.13
25	11.73	131	5.12	437	4.02
29	11.73	134	5.18	441	4.02
30	11.57	140	5.18	442	4.07
32	11.21	142	5.34	453	3.96
36	9.81	146	5.12	462	3.96
38	9.24	156	5.01	465	3.91
39	8.13	166	5.01	477	3.91
41	7.67	173	5.01	487	3.91
44	7.01	176	5.07	503	3.85
45	6.80	190	5.01	524	3.80
48	6.53	207	4.90	540	3.74
50	6.32	213	4.85	549	3.74
53	6.15	224	4.74	552	3.80
54	6.15	244	4.68	559	3.80
56	5.99	246	4.63	567	3.85
60	5.99	261	4.52	569	3.80
63	5.77	275	4.46	595	3.85
66	5.72	279	4.46	612	3.74
69	5.45	296	4.35	639	3.74
75	5.34	315	4.35	665	3.68
77	5.28	319	4.30	681	3.63
80	5.16	337	4.24	692	3.63
85	5.01	354	4.18	698	3.57
88	4.96	378	4.13	702	3.57
93	4.85	382	4.07	713	3.52
99	4.68	396	4.07	728	3.52
105	4.57	401	4.07	735	3.52
107	4.52	408	4.18	743	3.46
114	4.52	415	4.13	749	3.46


TEMPERATURE, C
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300
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900
1200
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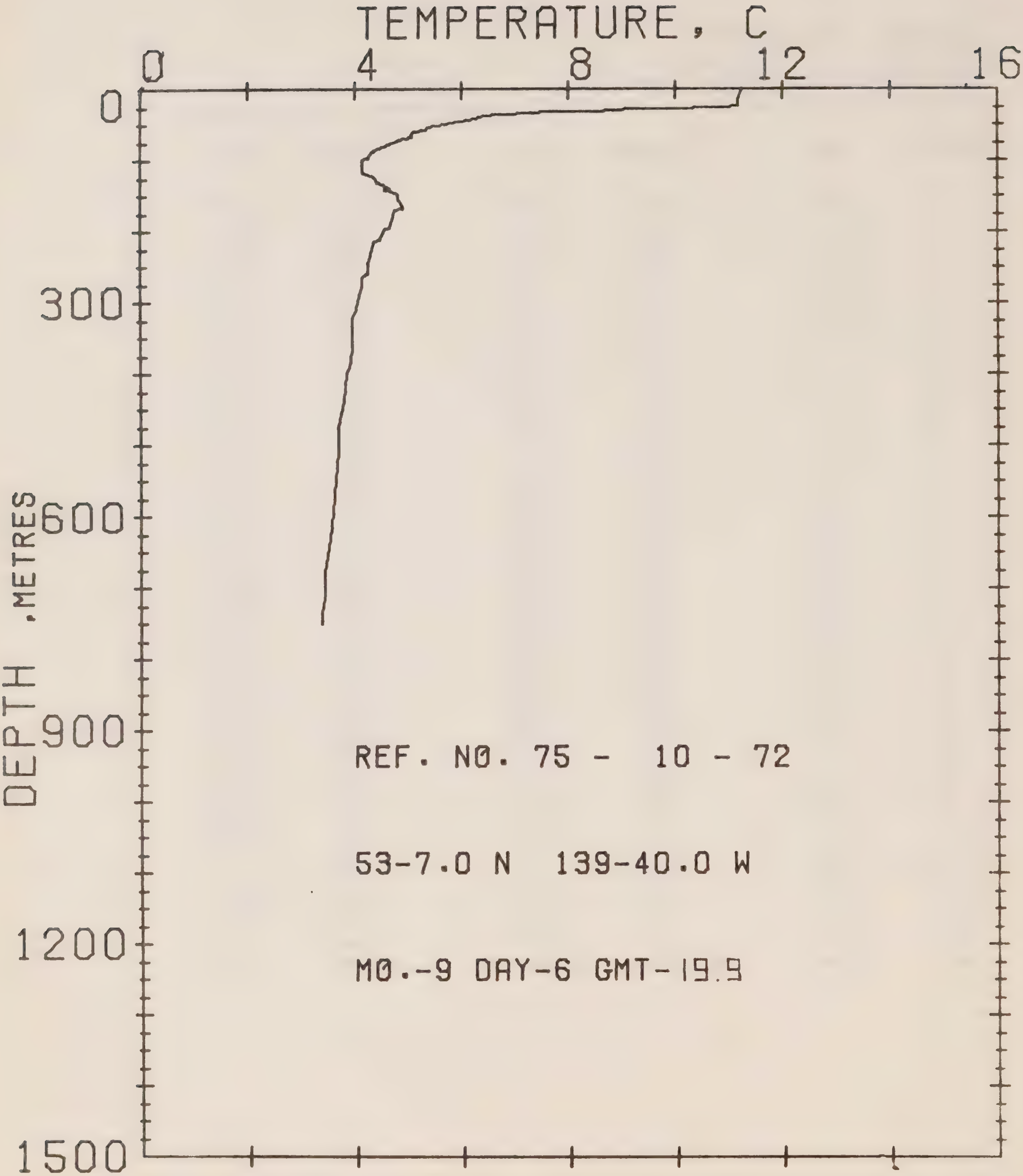
DEPTH ,METRES
REF. NO. 75 - 10 - 71
53-41.0 N 140-40.0 W
MO.-9 DAY-6 GMT-15.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 71   DATE 6/ 9/75
POSITION 53-41.0N 140-40.0W   GMT 15.0
RESULTS OF XBT CAST   99 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.26	128	3.96	256	4.07
2	11.01	131	4.13	261	4.02
6	11.01	133	4.18	264	3.91
12	11.57	136	4.13	270	3.91
14	11.57	138	4.13	280	3.96
16	11.57	141	4.24	291	3.91
19	11.47	145	4.35	299	3.96
21	11.32	146	4.52	312	3.91
25	11.32	147	4.63	325	3.91
26	10.85	150	4.57	337	3.91
29	10.49	153	4.57	350	3.85
32	10.13	159	4.52	368	3.91
33	9.60	164	4.46	377	3.85
34	8.61	165	4.52	392	3.85
37	7.39	169	4.52	405	3.80
38	7.01	173	4.52	423	3.80
40	6.37	178	4.52	442	3.74
45	6.05	182	4.41	454	3.74
51	5.56	187	4.35	469	3.66
53	5.28	190	4.35	481	3.74
58	5.07	192	4.35	495	3.63
63	4.90	195	4.35	503	3.63
65	4.63	200	4.24	518	3.63
70	4.52	203	4.24	537	3.63
76	4.30	208	4.24	561	3.57
84	4.18	212	4.24	592	3.52
91	4.02	215	4.24	624	3.46
105	3.85	219	4.13	641	3.41
111	3.96	223	4.13	658	3.41
115	3.91	227	4.07	683	3.35
117	3.80	236	4.07	700	3.29
122	3.74	241	4.02	730	3.24
125	3.85	250	4.13	745	3.24


TEMPERATURE, C
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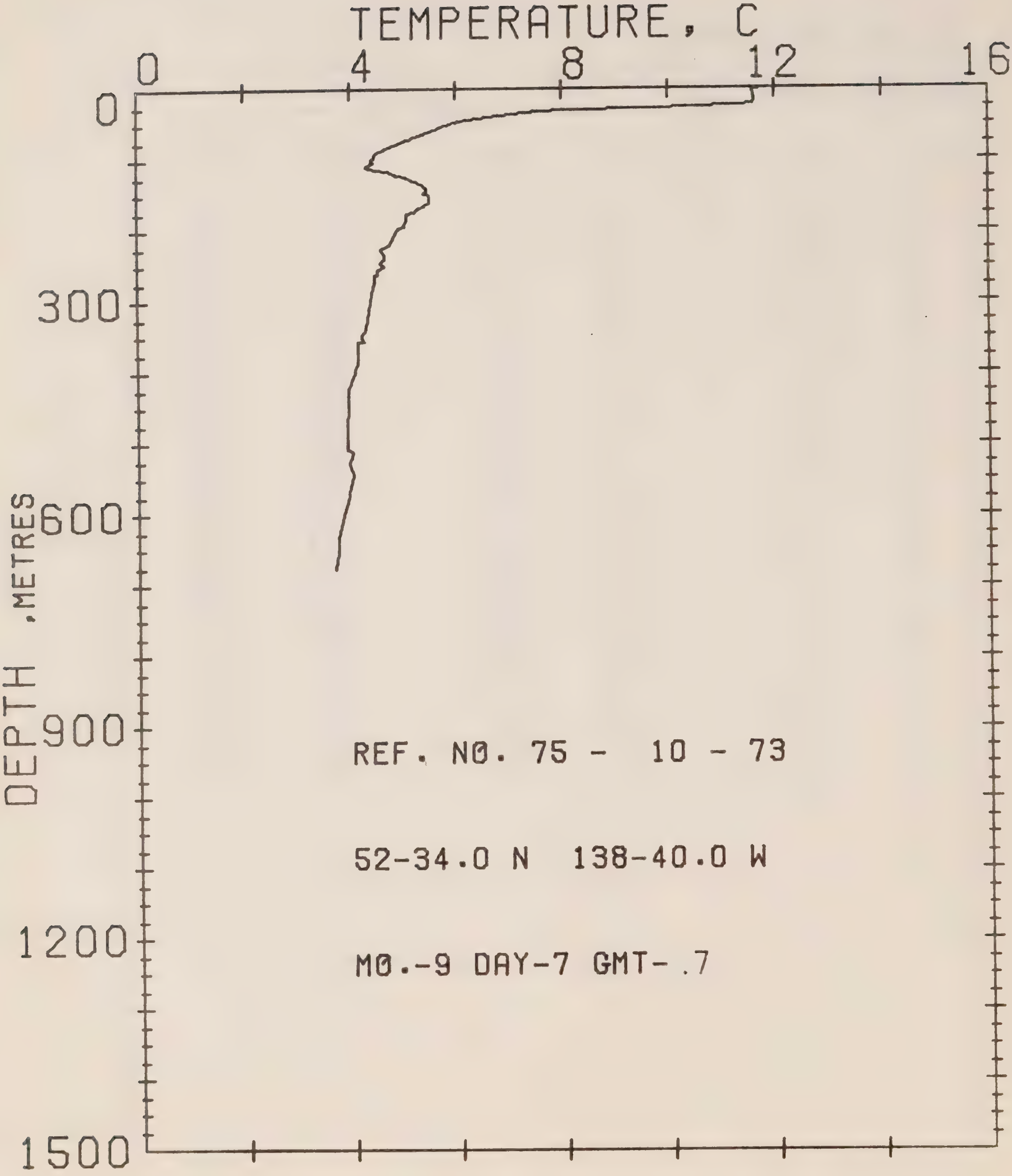
300
600
900
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 72
53-7.0 N 139-40.0 W
MO.-9 DAY-6 GMT-19.9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 72 DATE 6/ 9/75
POSITION 53- 7.0N 139-40.0W GMT 19.9
RESULTS OF XBT CAST 76 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	11.26	78	4.63	212	4.46
12	11.21	84	4.46	216	4.35
14	11.16	88	4.35	234	4.30
17	11.16	92	4.30	246	4.24
23	11.16	98	4.24	259	4.24
24	11.11	100	4.13	263	4.18
25	11.01	106	4.13	265	4.13
26	10.85	119	4.13	278	4.13
28	9.81	123	4.35	291	4.07
29	9.13	130	4.41	310	4.02
30	8.95	132	4.41	323	3.96
32	8.40	133	4.46	341	3.96
33	7.76	137	4.57	362	3.96
34	7.18	140	4.63	384	3.91
35	6.91	142	4.57	399	3.85
36	6.69	144	4.68	438	3.80
38	6.42	149	4.79	475	3.68
45	6.15	152	4.79	509	3.68
46	5.94	157	4.79	548	3.63
51	5.67	161	4.85	594	3.57
54	5.39	167	4.90	631	3.52
57	5.34	170	4.74	678	3.41
61	5.12	189	4.68	714	3.41
63	5.07	195	4.63	735	3.35
67	5.07	196	4.57	749	3.35
73	4.85				


TEMPERATURE, C
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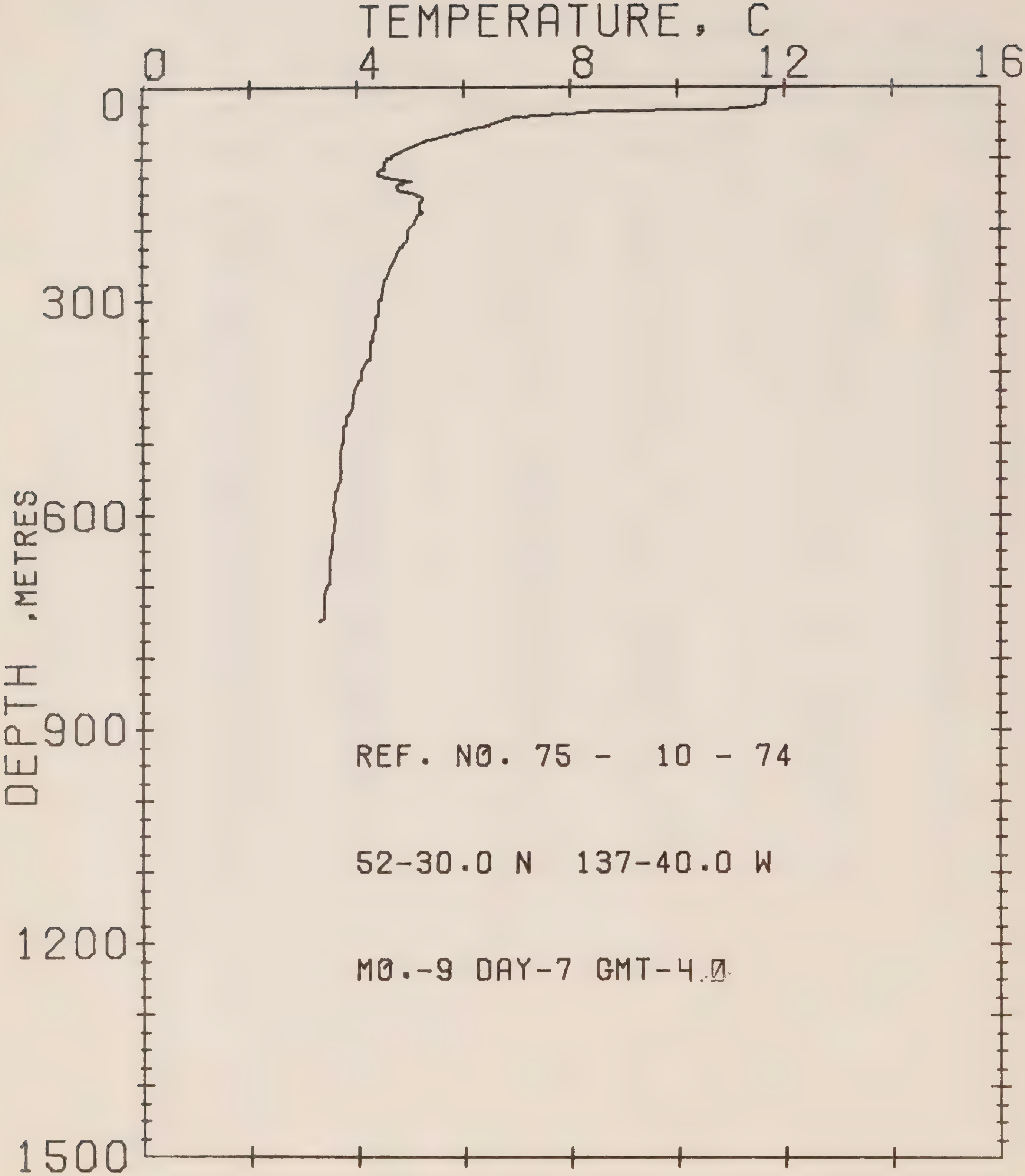
16
DEPTH ,METRES
0
300
600
900
1200
1500
REF. N0. 75 - 10 - 73
52-34.0 N 138-40.0 W
M0.-9 DAY-7 GMT- .7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 73   DATE 7/ 9/75
POSITION 52-34.0N 136-40.0W   GMT 0.7
RESULTS OF XBT CAST   88 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.68	118	4.74	261	4.52
5	11.57	122	4.85	262	4.46
19	11.62	123	5.01	273	4.46
22	11.57	126	5.07	289	4.41
23	11.37	130	5.18	313	4.35
26	10.33	133	5.28	337	4.30
28	9.86	138	5.39	349	4.18
29	9.24	141	5.45	355	4.24
30	8.50	144	5.45	357	4.13
31	8.03	146	5.45	364	4.13
34	7.28	148	5.39	368	4.13
35	7.12	150	5.50	388	4.13
38	6.80	160	5.50	393	4.07
41	6.42	166	5.39	400	4.07
44	6.26	170	5.28	409	4.02
46	6.05	173	5.23	424	3.96
54	5.72	177	5.07	450	3.96
63	5.39	184	5.07	474	3.91
74	5.01	194	5.01	502	3.91
83	4.74	198	4.90	509	3.91
87	4.63	203	4.85	513	4.02
91	4.52	212	4.79	528	3.96
95	4.46	220	4.74	545	4.02
98	4.46	226	4.57	570	3.96
100	4.41	233	4.63	583	3.91
103	4.41	241	4.63	599	3.85
105	4.46	246	4.57	632	3.74
110	4.30	251	4.63	652	3.74
113	4.35	256	4.52	675	3.68
116	4.63				



TEMPERATURE, C
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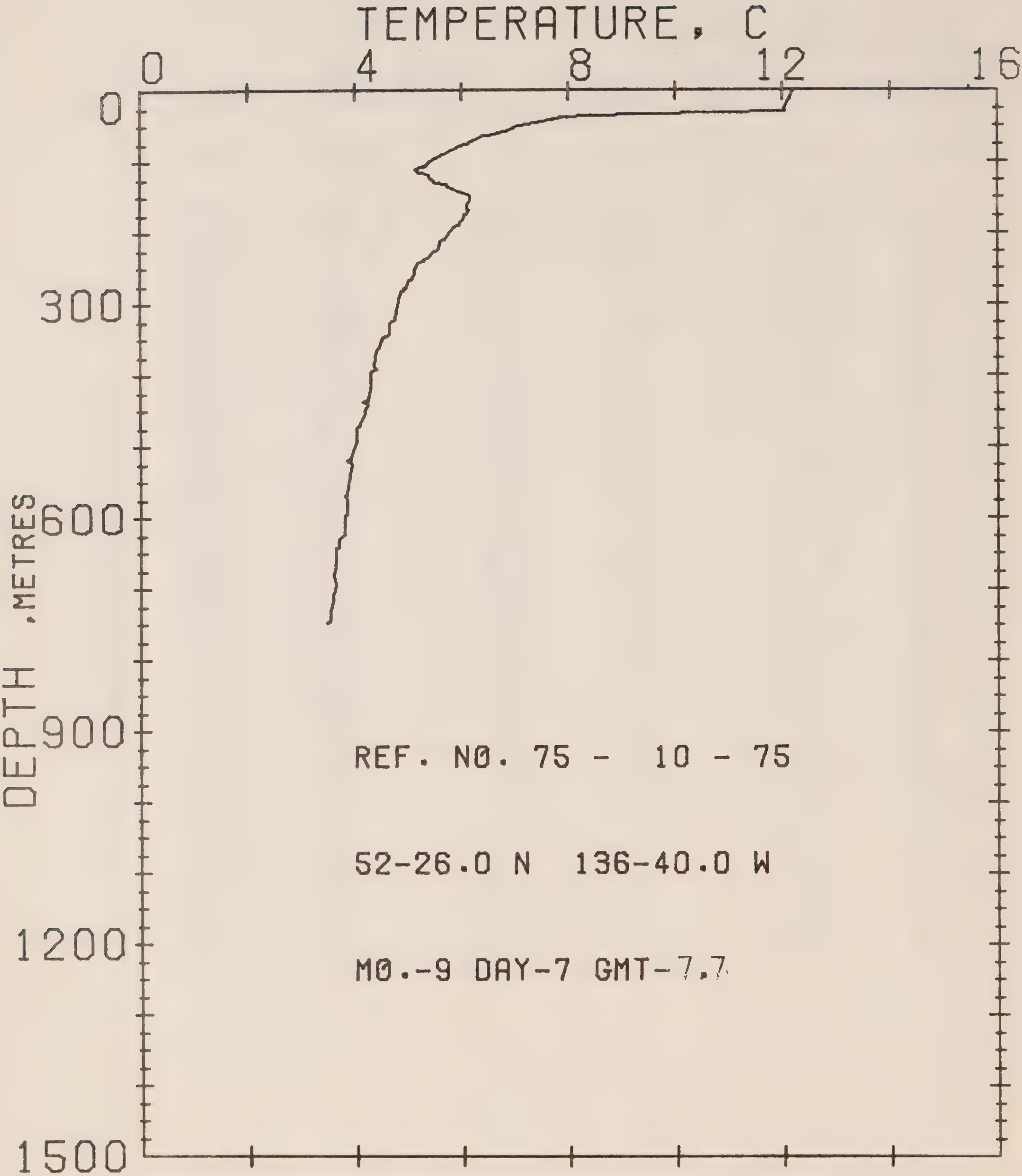
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 74
52-30.0 N 137-40.0 W
MO.-9 DAY-7 GMT-4.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 74 DATE 7/ 9/75
POSITION 52-30.0N 137-40.0W GMT 4.0
RESULTS OF XBT CAST 96 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	11.83	132	5.01	381	4.24
2	11.68	133	4.90	385	4.16
23	11.62	136	4.85	398	4.07
28	11.42	137	4.74	407	4.07
30	11.16	143	4.74	410	4.07
32	10.80	150	5.12	413	4.02
34	8.46	152	5.12	425	3.96
35	8.34	154	5.23	435	3.91
41	7.01	157	5.23	448	3.91
42	7.01	159	5.23	460	3.85
44	6.80	161	5.23	462	3.80
46	6.85	163	5.18	474	3.80
48	6.69	174	5.18	476	3.74
55	6.48	177	5.23	494	3.74
59	6.10	181	5.12	511	3.68
60	6.05	192	5.07	528	3.68
62	5.99	201	4.96	550	3.63
65	5.94	212	4.96	570	3.57
67	5.67	224	4.85	577	3.57
76	5.28	226	4.79	591	3.52
87	4.96	249	4.68	605	3.57
93	4.79	251	4.63	630	3.52
96	4.68	268	4.57	643	3.52
99	4.63	272	4.52	663	3.46
100	4.57	298	4.46	689	3.46
105	4.57	301	4.41	696	3.46
107	4.52	320	4.41	700	3.41
116	4.52	323	4.35	703	3.41
117	4.41	337	4.35	710	3.35
123	4.41	347	4.30	728	3.35
125	4.52	355	4.30	744	3.35
131	5.01	356	4.24	747	3.29


TEMPERATURE, C
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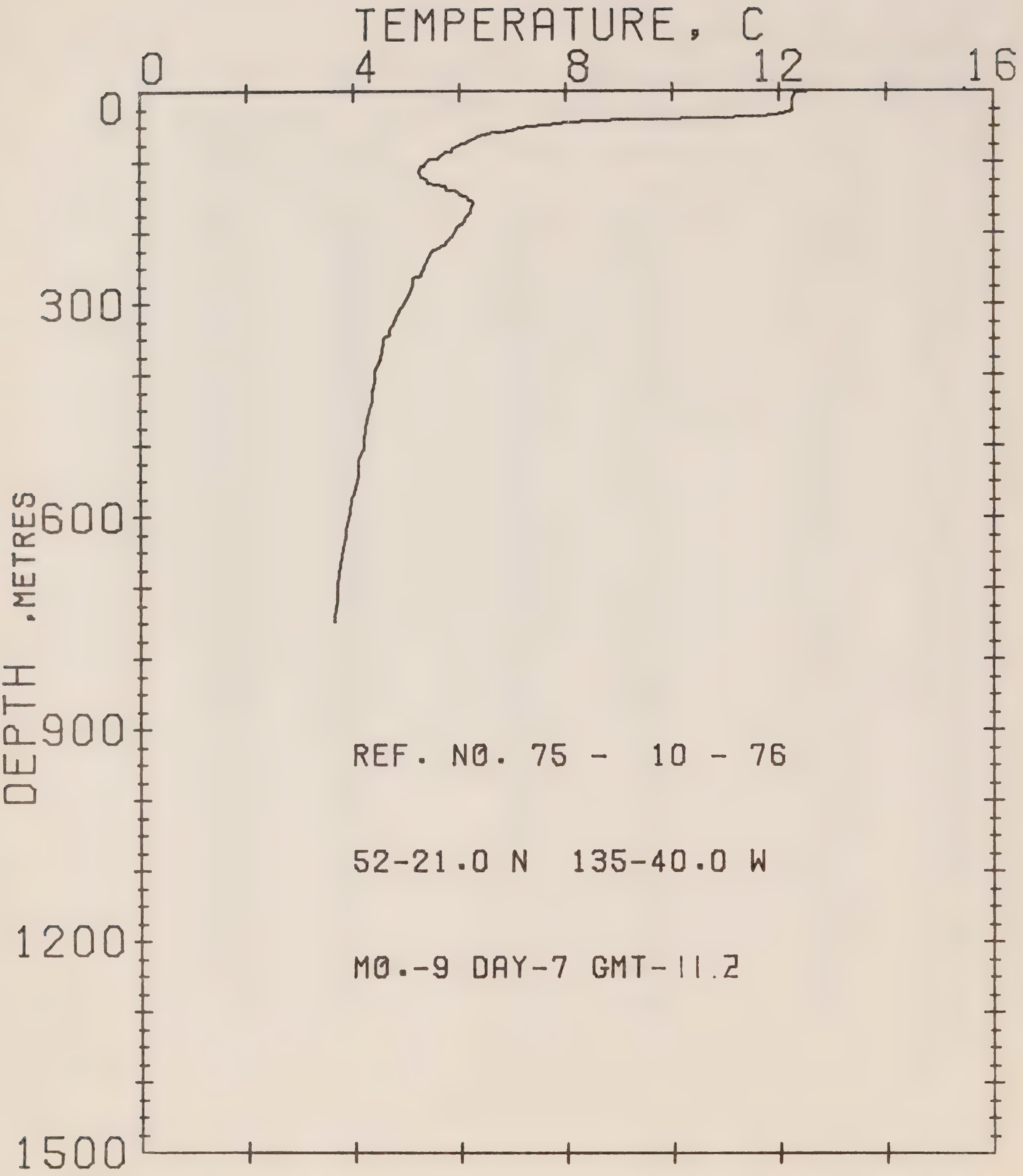
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 75
52-26.0 N 136-40.0 W
MO.-9 DAY-7 GMT-7.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 75 DATE 7/ 9/75
POSITION 52-26.0N 136-40.0W GMT 7.7
RESULTS OF XBT CAST 107 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	12.29	149	6.15	407	4.30
1	12.19	152	6.15	417	4.30
14	12.14	157	6.15	435	4.24
18	12.09	159	6.10	437	4.13
29	12.04	167	6.10	438	4.18
30	12.04	169	6.15	442	4.24
34	9.45	173	6.10	452	4.18
36	8.40	174	6.05	454	4.13
38	7.97	178	6.05	472	4.07
40	7.71	191	5.94	473	4.02
42	7.71	192	5.88	491	4.02
43	7.65	202	5.77	493	4.02
46	7.39	210	5.67	517	3.91
49	7.28	212	5.61	521	3.85
50	7.07	216	5.61	527	3.96
54	6.96	219	5.56	529	3.91
58	6.85	221	5.56	569	3.85
60	6.69	240	5.28	571	3.80
64	6.53	243	5.18	573	3.85
65	6.42	252	5.12	596	3.85
72	6.21	258	5.12	597	3.80
74	6.15	266	5.07	624	3.80
78	5.99	267	5.01	631	3.68
93	5.61	277	4.96	641	3.68
101	5.39	278	4.90	642	3.63
106	5.34	282	4.90	668	3.63
108	5.28	283	4.85	671	3.63
109	5.18	322	4.74	683	3.57
112	5.12	327	4.63	695	3.63
115	5.18	342	4.63	711	3.57
117	5.39	349	4.52	716	3.57
124	5.39	363	4.46	732	3.52
127	5.45	365	4.41	740	3.52
129	5.50	369	4.35	746	3.52
131	5.72	392	4.41	747	3.46
136	5.72	397	4.30		


TEMPERATURE, C
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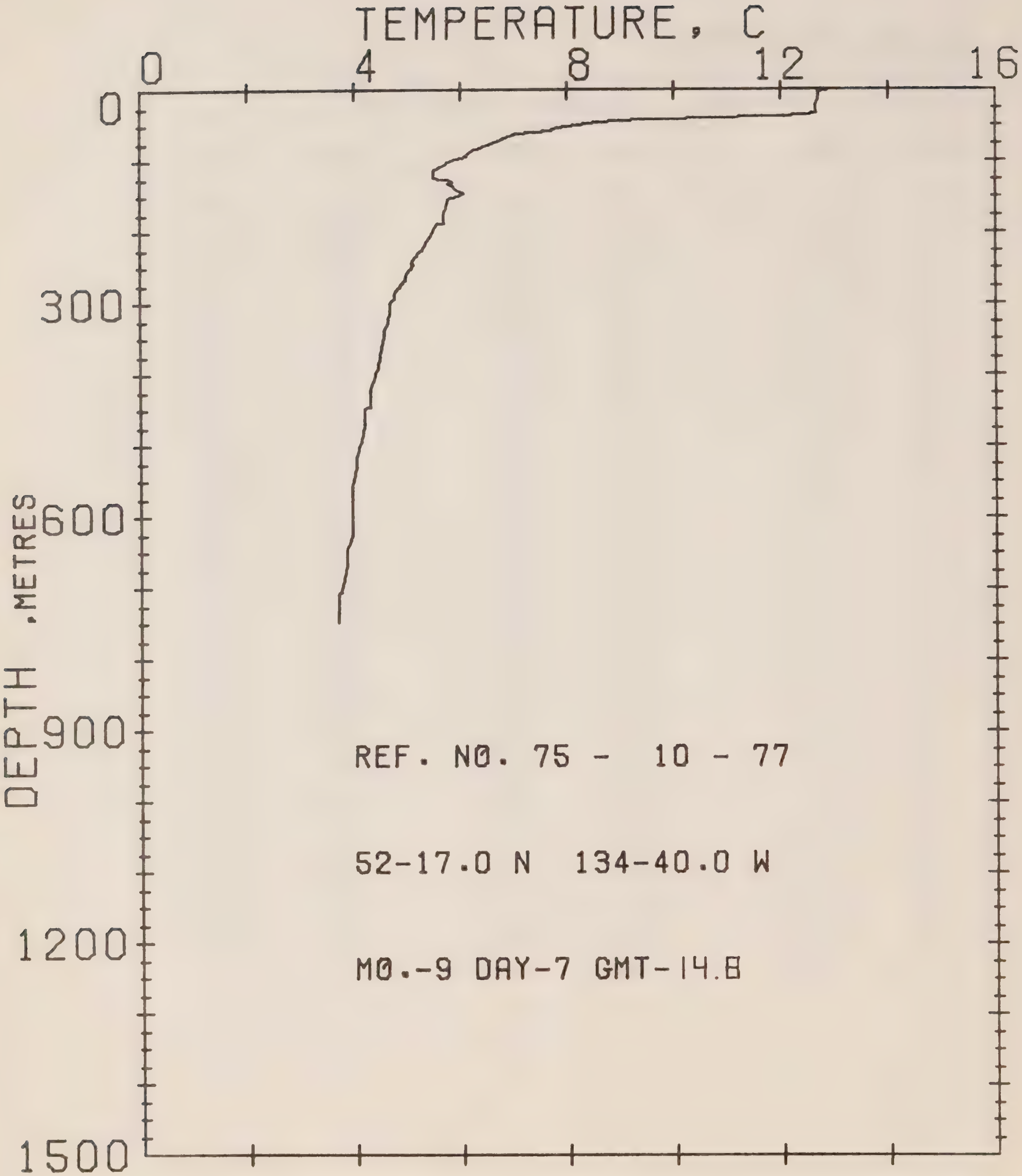
DEPTH ,METRES
REF. N0. 75 - 10 - 76
52-21.0 N 135-40.0 W
M0.-9 DAY-7 GMT-11.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 76 DATE 7/ 9/75
POSITION 52-21.0N 135-40.0W GMT 11.2
RESULTS OF XBT CAST 98 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.50	114	5.23	269	5.12
2	12.34	122	5.28	274	5.12
5	12.29	126	5.39	286	5.07
13	12.24	129	5.39	299	4.96
18	12.24	135	5.72	312	4.85
25	12.24	137	5.77	323	4.79
28	12.24	139	5.77	337	4.68
31	12.19	140	5.89	345	4.68
32	12.09	142	5.94	349	4.57
35	11.68	145	5.99	357	4.57
37	10.64	147	5.99	378	4.52
39	9.66	148	6.05	395	4.41
40	9.19	150	6.15	410	4.41
42	8.55	153	6.15	423	4.35
45	8.03	154	6.21	439	4.35
48	7.65	158	6.26	464	4.24
50	7.34	166	6.21	491	4.18
52	7.18	172	6.21	507	4.18
55	7.07	176	6.15	512	4.13
56	7.01	180	6.10	521	4.07
57	6.75	185	6.10	541	4.07
58	6.69	188	6.05	560	4.02
61	6.53	189	5.99	576	3.96
65	6.37	193	5.94	595	3.91
71	6.15	206	5.88	617	3.85
75	5.99	207	5.83	630	3.85
83	5.88	217	5.72	644	3.80
86	5.83	226	5.59	669	3.74
87	5.72	231	5.45	696	3.68
95	5.61	241	5.39	719	3.68
97	5.45	250	5.34	741	3.63
106	5.34	259	5.23	748	3.63
107	5.28	264	5.12		


TEMPERATURE, C
0
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12
16
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300
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900
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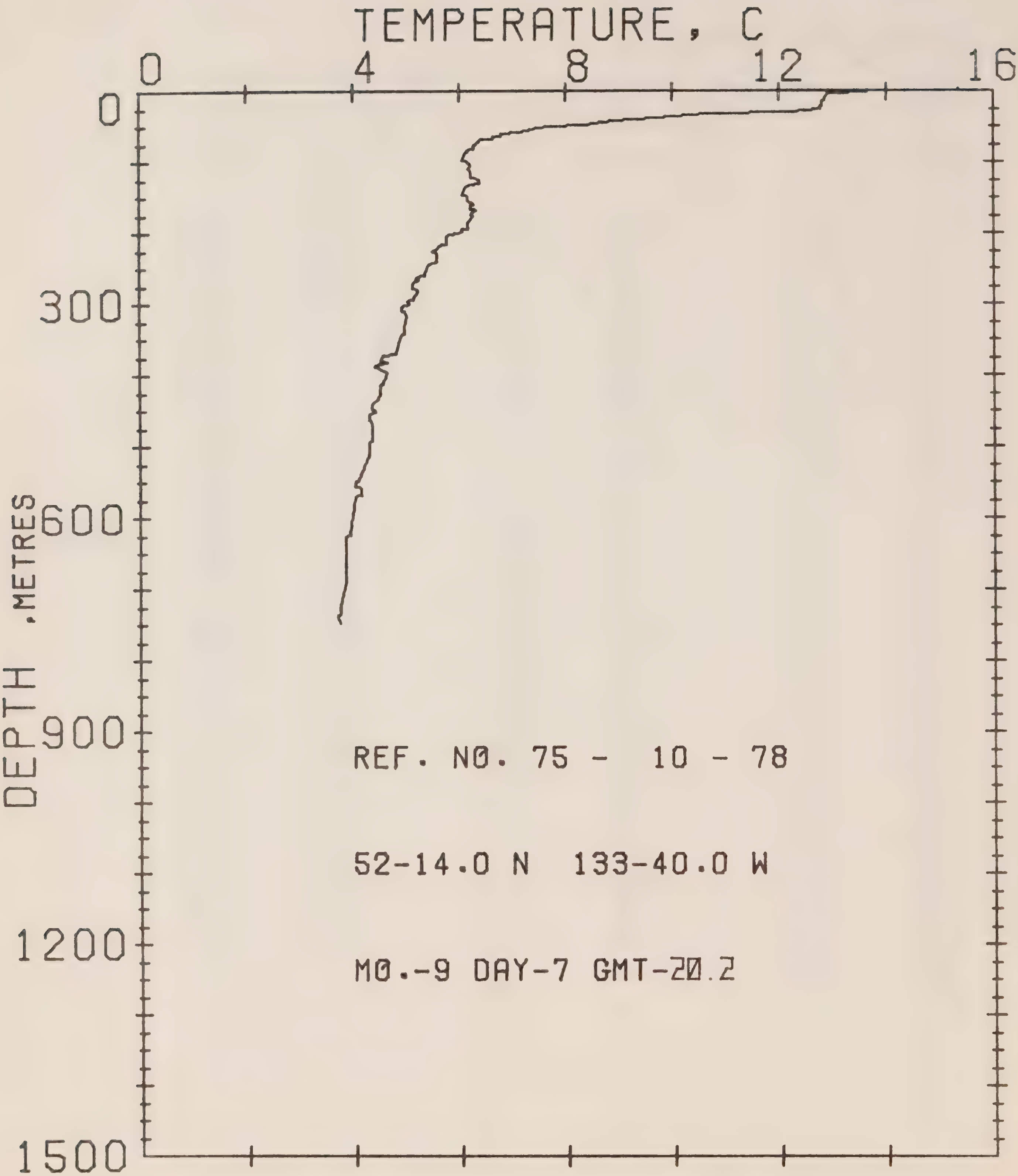
DEPTH ,METRES
REF. NO. 75 - 10 - 77
52-17.0 N 134-40.0 W
MO.-9 DAY-7 GMT-14.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 77 DATE 7/ 9/75
POSITION 52-17.0N 134-40.0W GMT 14.8
RESULTS OF XBT CAST . 100 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	12.86	131	5.77	308	4.68
3	12.70	133	5.77	312	4.68
13	12.70	138	5.83	326	4.63
22	12.65	145	6.05	338	4.57
34	12.65	146	5.99	344	4.57
36	12.40	147	6.05	347	4.57
37	12.04	152	5.88	362	4.52
38	11.62	155	5.77	391	4.46
40	10.75	165	5.72	401	4.41
42	9.71	173	5.67	422	4.30
43	9.39	180	5.67	446	4.30
45	9.03	187	5.67	448	4.13
47	8.55	188	5.56	470	4.18
50	8.19	198	5.50	495	4.13
53	7.81	207	5.45	502	4.07
56	7.71	212	5.39	505	4.07
60	7.39	219	5.34	517	4.02
62	7.07	225	5.28	530	4.02
67	6.85	227	5.23	558	3.96
70	6.80	234	5.18	575	3.96
75	6.59	238	5.12	598	3.96
82	6.37	244	5.07	626	3.96
87	6.21	247	5.12	633	3.91
94	6.10	252	5.07	646	3.85
100	5.83	257	5.01	669	3.85
104	5.72	263	4.96	688	3.80
109	5.61	268	4.96	706	3.74
111	5.56	272	4.90	709	3.68
114	5.50	278	4.85	721	3.63
118	5.50	281	4.79	734	3.68
123	5.50	289	4.74	743	3.68
125	5.56	294	4.74	746	3.68
127	5.72	301	4.68	748	3.68
129	5.83				


TEMPERATURE, C
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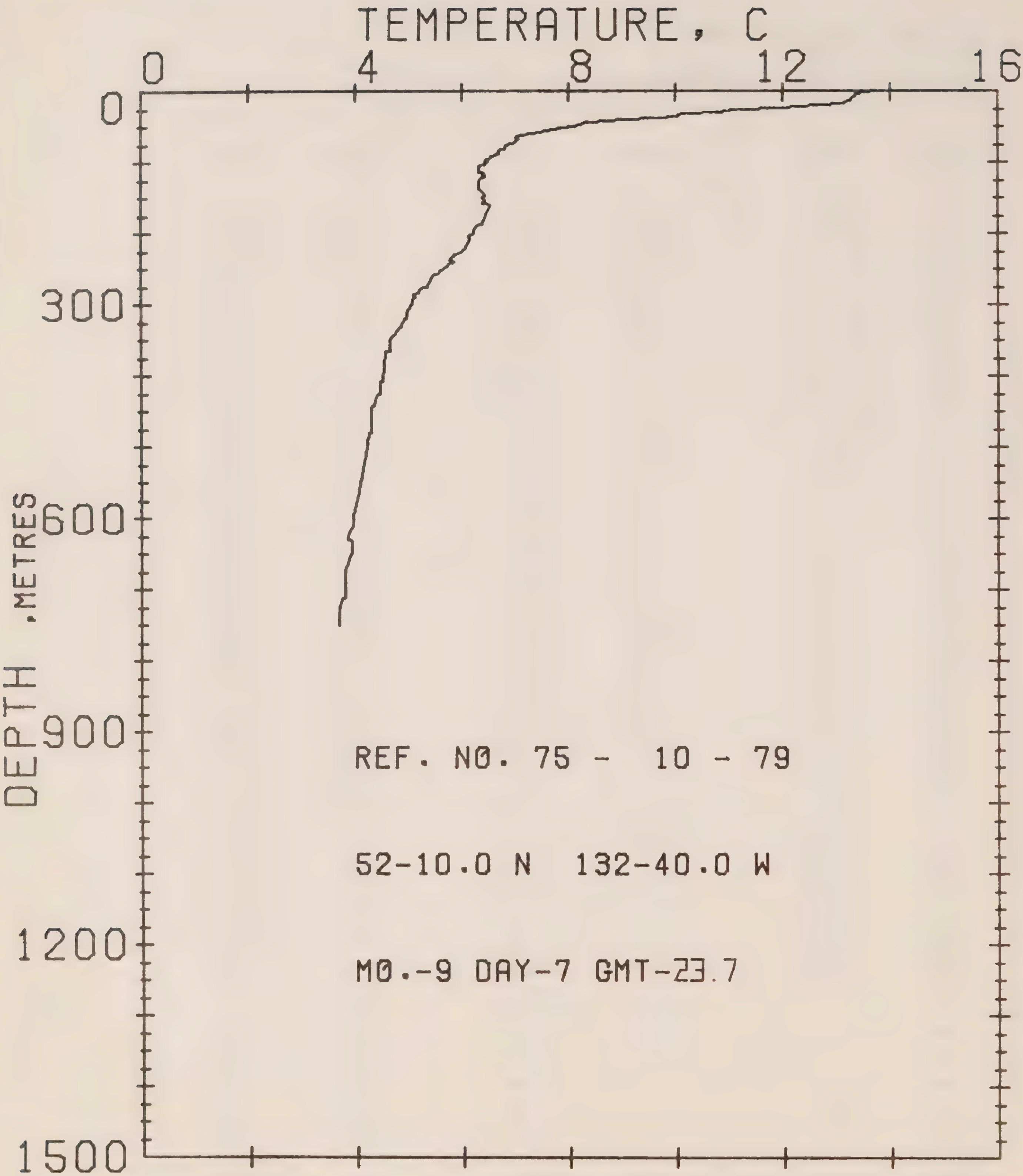
DEPTH ,METRES
REF. NO. 75 - 10 - 78
52-14.0 N 133-40.0 W
MO.-9 DAY-7 GMT-20.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 78   DATE 7/ 9/75
POSITION 52-14.0N 133-40.0W   GMT 20.2
RESULTS OF XBT CAST 126 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.62	134	6.15	370	4.79
3	12.96	137	6.10	373	4.57
4	12.91	145	6.05	380	4.52
14	12.86	148	6.15	381	4.63
15	12.80	155	6.15	383	4.52
21	12.80	159	6.26	389	4.41
23	12.75	161	6.21	396	4.63
26	12.75	166	6.21	412	4.57
29	12.45	168	6.32	414	4.52
30	12.29	171	6.26	426	4.52
33	10.64	174	6.21	434	4.46
37	9.71	176	6.26	441	4.35
43	8.92	186	6.15	447	4.35
44	8.71	193	6.15	449	4.41
48	8.40	194	6.05	452	4.41
50	7.71	198	6.05	455	4.30
52	7.50	203	5.77	459	4.30
58	7.18	212	5.77	462	4.30
61	6.80	216	5.77	467	4.35
63	6.80	217	5.67	476	4.35
65	6.64	225	5.50	491	4.35
67	6.64	227	5.56	495	4.30
68	6.42	240	5.56	515	4.30
73	6.37	243	5.45	521	4.24
76	6.32	250	5.39	540	4.13
79	6.26	259	5.34	547	4.07
81	6.26	261	5.23	550	4.02
84	6.15	264	5.18	556	4.02
87	6.15	267	5.23	558	4.13
89	6.10	272	5.12	568	4.13
98	6.05	278	5.12	571	4.02
99	6.15	281	5.23	624	3.91
101	6.15	295	5.12	626	3.85
104	6.21	296	5.01	648	3.85
107	6.21	301	5.07	669	3.85
109	6.15	304	4.90	690	3.85
111	6.15	309	4.90	707	3.80
114	6.21	310	4.96	725	3.74
122	6.21	319	5.01	735	3.74
123	6.37	332	4.95	736	3.68
129	6.37	342	4.96	742	3.68
132	6.26	344	4.90	748	3.74


TEMPERATURE, C
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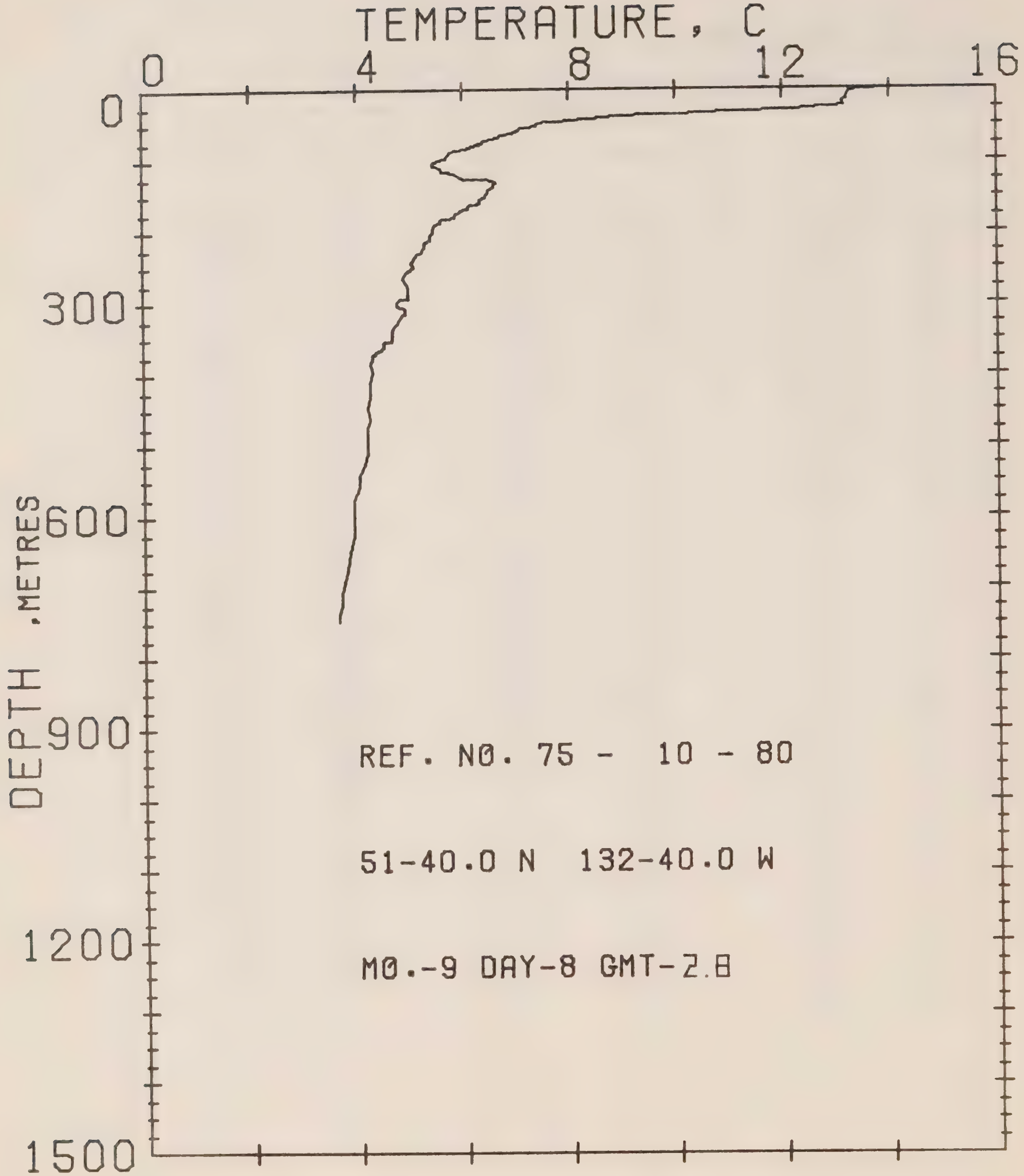
DEPTH ,METRES
REF. NO. 75 - 10 - 79
52-10.0 N 132-40.0 W
MO.-9 DAY-7 GMT-23.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 79 DATE 7/ 9/75
POSITION 52-10.0N 132-40.0W GMT 23.7
RESULTS OF XBT CAST 103 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.72	117	6.37	331	4.85
3	13.37	120	6.42	336	4.79
8	13.32	127	6.32	348	4.68
13	13.26	138	6.32	351	4.63
14	13.21	146	6.42	365	4.63
19	13.11	148	6.42	367	4.57
22	12.24	150	6.37	408	4.52
24	12.09	154	6.42	409	4.46
27	11.06	158	6.37	426	4.46
30	10.85	161	6.53	428	4.41
33	10.13	167	6.37	441	4.35
36	10.02	191	6.26	443	4.30
37	9.71	200	6.21	479	4.30
39	8.98	206	6.10	480	4.24
42	8.82	208	6.15	511	4.18
45	8.34	221	6.05	532	4.15
50	8.13	226	5.99	552	4.07
52	7.87	231	5.83	573	4.02
61	7.34	237	5.77	596	3.96
62	7.12	241	5.83	612	3.96
66	7.01	246	5.72	614	3.91
69	7.07	253	5.56	623	3.85
73	7.01	263	5.45	630	3.85
75	6.85	276	5.34	633	3.91
82	6.80	278	5.23	647	3.91
84	6.69	285	5.18	674	3.80
88	6.69	287	5.07	707	3.80
91	6.64	290	5.12	713	3.80
94	6.53	294	5.07	714	3.74
99	6.42	301	5.07	726	3.68
100	6.46	307	5.01	738	3.68
105	6.42	310	4.96	744	3.68
107	6.32	320	4.96	747	3.68
114	6.32	322	4.90	749	3.68
116	6.42				



TEMPERATURE, C
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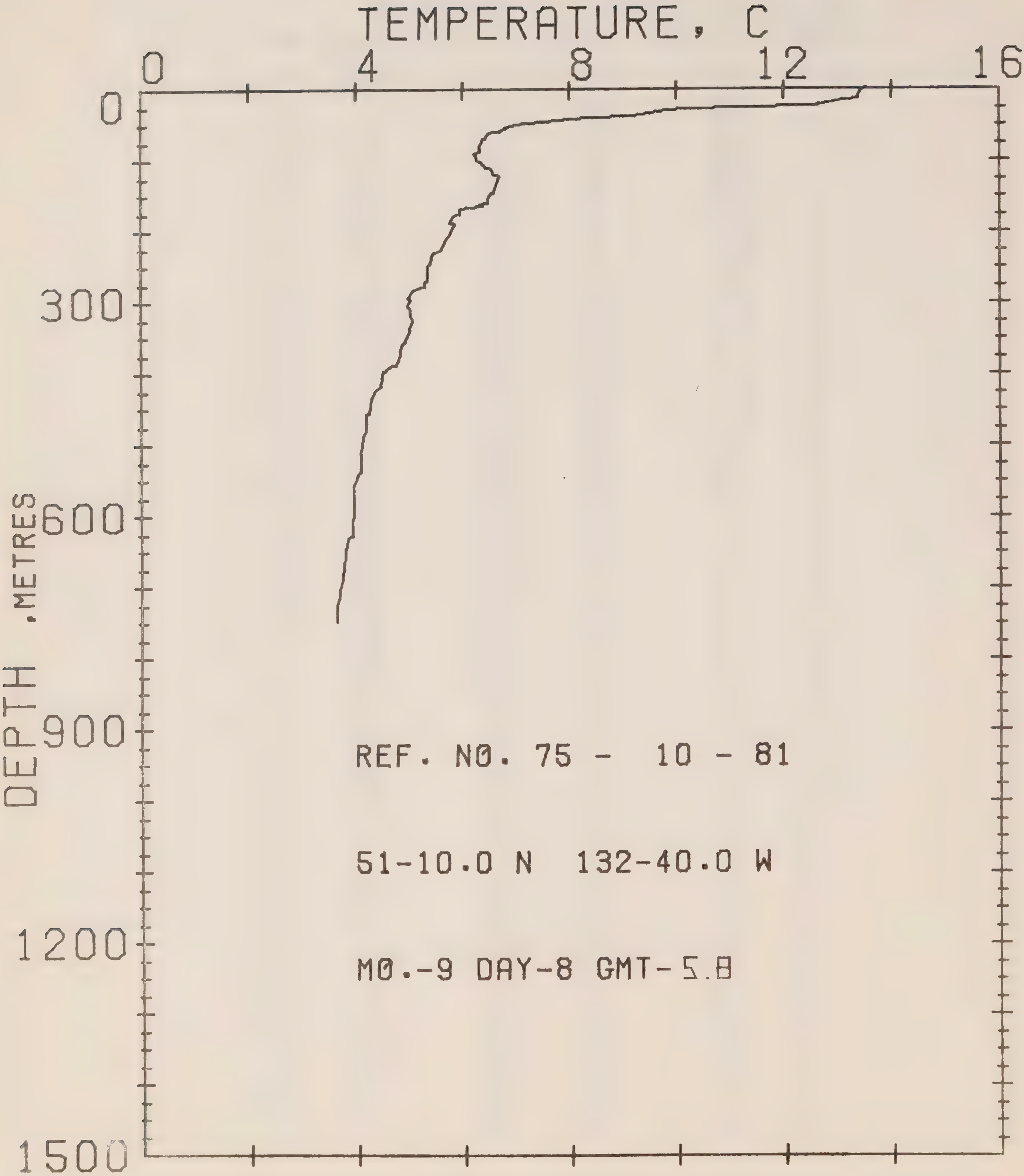
DEPTH .METRES
REF. NO. 75 - 10 - 80
51-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-2.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 80 DATE 8/ 9/75
POSITION 51-40.0N 132-40.0W GMT 2.8
RESULTS OF XBT CAST 173 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	14.03	116	5.77	253	5.01
2	13.42	118	5.77	257	4.96
3	13.32	120	5.88	260	4.90
5	13.26	123	5.94	266	4.85
11	13.21	125	5.99	272	4.90
16	13.21	126	6.21	279	4.96
18	13.11	127	6.37	287	4.96
20	13.11	128	6.53	293	4.96
24	13.11	129	6.59	294	4.85
26	13.01	131	6.64	297	4.79
27	12.75	133	6.59	301	4.74
29	12.45	137	6.59	303	4.74
30	12.24	140	6.53	306	4.79
31	11.88	141	6.53	308	4.90
32	11.37	142	6.48	311	4.90
33	11.06	144	6.48	315	4.90
34	10.44	147	6.48	319	4.85
35	10.07	150	6.42	338	4.68
36	9.34	152	6.42	344	4.68
37	9.19	153	6.37	349	4.68
38	8.98	155	6.32	353	4.63
40	8.61	156	6.32	354	4.57
41	8.50	158	6.32	356	4.52
42	8.45	160	6.32	357	4.52
43	8.34	162	6.26	360	4.52
45	8.03	163	6.15	362	4.52
46	7.81	166	6.10	365	4.46
47	7.60	167	6.10	368	4.41
48	7.50	168	6.10	370	4.35
50	7.39	169	6.05	372	4.35
52	7.39	171	5.99	374	4.30
53	7.28	172	5.94	376	4.30
55	7.12	175	5.88	380	4.30
57	7.07	177	5.88	386	4.24
60	7.01	179	5.83	398	4.30
61	7.01	181	5.77	411	4.24
62	6.96	183	5.67	431	4.24
63	6.80	184	5.56	448	4.18
65	6.75	187	5.56	464	4.24
67	6.69	191	5.50	476	4.18
68	6.64	195	5.45	492	4.18
71	6.48	199	5.45	513	4.18
73	6.42	202	5.45	526	4.13
75	6.37	205	5.39	544	4.02
77	6.26	208	5.39	558	4.02
78	6.32	210	5.39	574	3.96
80	6.21	212	5.39	577	3.91
81	6.15	214	5.34	592	3.91
85	5.94	216	5.28	612	3.91
87	5.88	218	5.28	628	3.91
89	5.77	221	5.28	651	3.85
98	5.67	223	5.28	675	3.80
99	5.56	227	5.23	693	3.74
102	5.50	234	5.12	709	3.68
104	5.45	240	5.07	726	3.68
108	5.45	243	5.01	740	3.63
111	5.56	248	5.07	748	3.63
115	5.61	250	5.07		


TEMPERATURE, C
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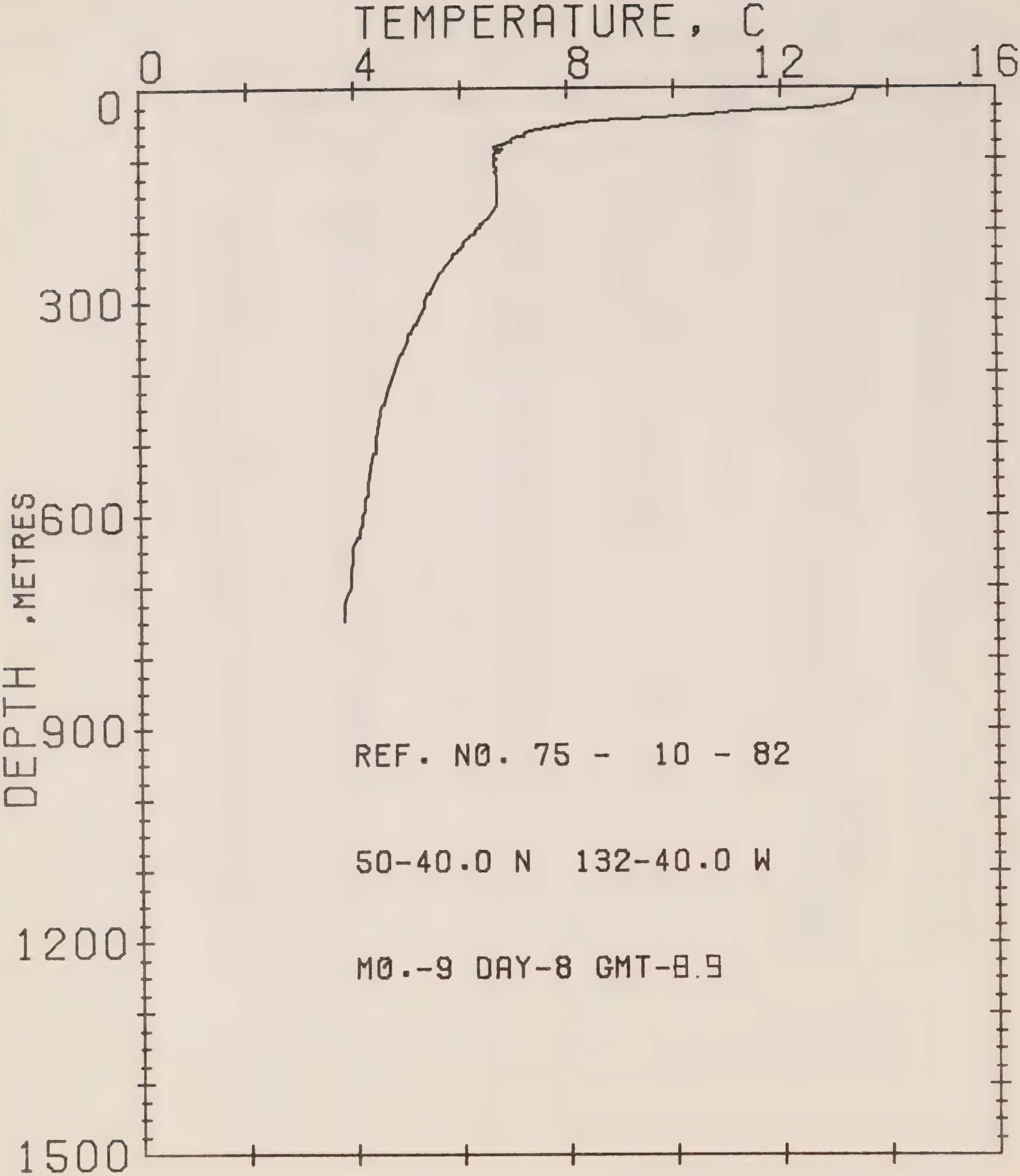
DEPTH ,METRES
REF. NO. 75 - 10 - 81
51-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-5.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 81   DATE 8/ 9/75
POSITION 51-10.0N 132-40.0W   GMT 5.8
RESULTS OF XBT CAST   94 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	13.52	146	6.59	387	4.74
5	13.42	147	6.53	389	4.68
14	13.37	156	6.48	396	4.57
18	12.96	159	6.48	397	4.52
20	12.91	163	6.32	419	4.43
22	12.65	164	6.37	427	4.35
23	12.60	169	5.94	434	4.30
25	11.11	177	5.94	455	4.24
29	10.23	178	5.83	456	4.16
31	9.81	188	5.77	479	4.18
37	9.19	191	5.88	489	4.13
40	8.40	225	5.61	512	4.07
44	7.76	231	5.45	527	4.07
46	7.60	246	5.39	538	4.07
48	7.18	250	5.34	542	4.02
53	6.80	270	5.34	559	3.96
56	6.80	271	5.28	580	3.96
59	6.69	278	5.28	593	3.96
61	6.59	280	5.18	596	3.96
64	6.46	284	5.07	610	3.91
70	6.42	295	4.96	628	3.91
71	6.37	297	5.01	630	3.85
82	6.32	305	4.96	650	3.80
88	6.32	310	5.01	654	3.80
92	6.21	318	5.01	688	3.74
96	6.26	325	5.07	706	3.66
100	6.26	337	5.01	715	3.63
107	6.37	341	5.01	727	3.65
109	6.42	356	4.90	737	3.63
113	6.53	360	4.85	743	3.63
120	6.59	361	4.79	748	3.63
122	6.69				



TEMPERATURE, C
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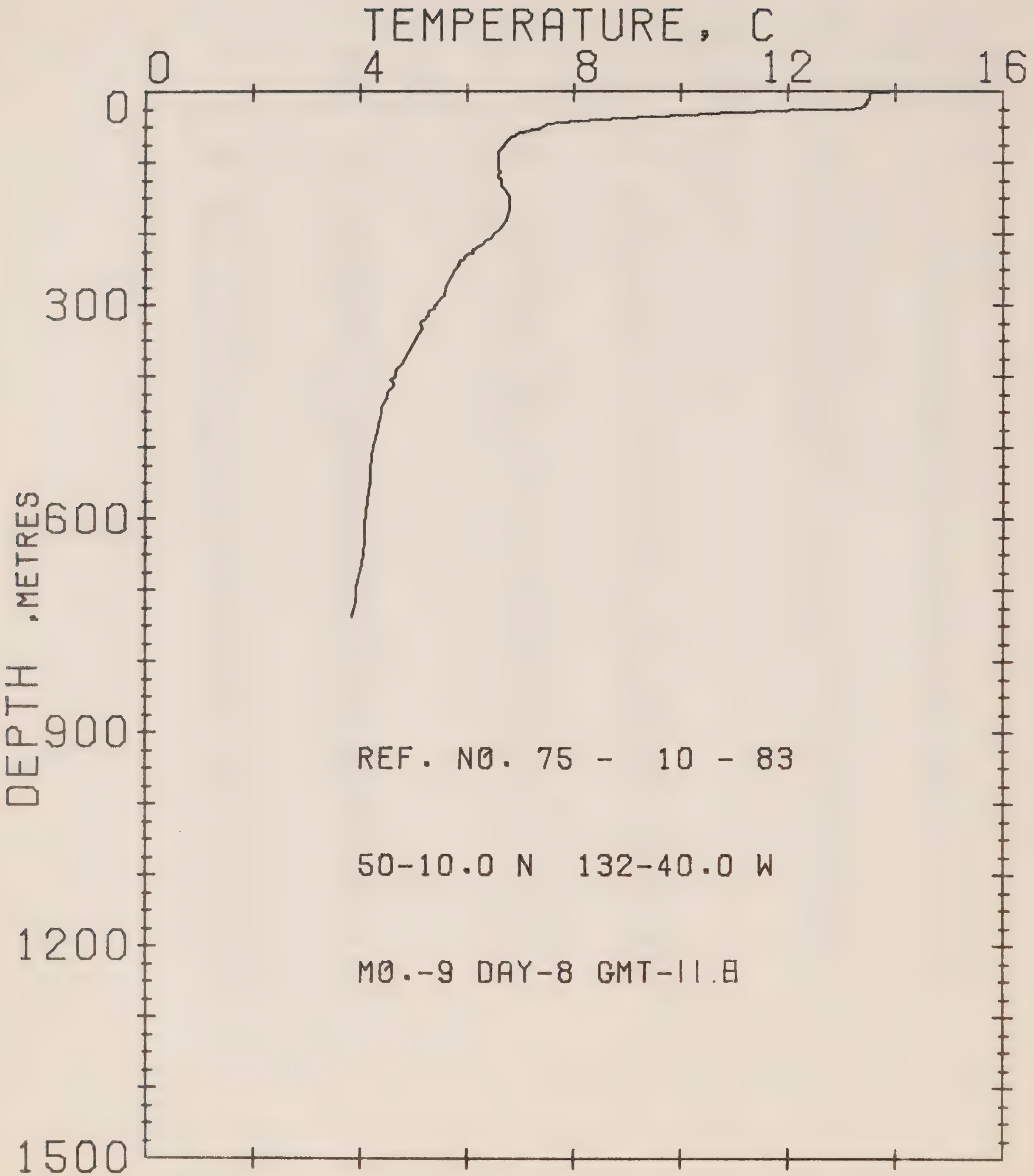
DEPTH ,METRES
REF. NO. 75 - 10 - 82
50-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-8.9

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 32   DATE 8/ 9/75
POSITION 50-40.0N 132-40.0W   GMT 8.9
RESULTS OF XBT CAST   102 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.33	118	6.64	346	5.01
2	13.42	124	6.69	354	5.01
19	13.32	141	6.69	373	4.90
24	13.11	159	6.69	376	4.85
28	12.80	165	6.69	388	4.79
30	12.45	172	6.64	418	4.66
34	11.11	182	6.53	420	4.63
36	11.01	189	6.42	443	4.57
40	10.02	190	6.37	446	4.52
42	9.81	195	6.37	468	4.46
45	8.98	197	6.32	493	4.41
47	8.66	204	6.26	512	4.41
48	8.24	210	6.15	513	4.35
56	7.65	218	6.05	532	4.30
61	7.34	223	6.05	557	4.24
65	7.23	225	5.99	572	4.24
67	7.23	230	5.94	576	4.18
69	7.07	233	5.89	592	4.18
74	6.96	237	5.88	603	4.13
76	6.96	241	5.83	615	4.13
78	6.85	250	5.72	620	4.07
80	6.80	263	5.61	630	4.07
81	6.69	266	5.56	632	4.02
83	6.64	278	5.50	643	3.96
85	6.64	287	5.45	657	3.96
87	6.80	289	5.39	661	3.96
90	6.75	300	5.34	679	3.91
92	6.64	307	5.34	702	3.91
96	6.64	317	5.28	712	3.85
99	6.69	322	5.23	724	3.80
101	6.64	323	5.23	734	3.80
111	6.64	332	5.18	743	3.80
113	6.69	335	5.12	747	3.80
115	6.69	344	5.07	748	3.80


TEMPERATURE, C
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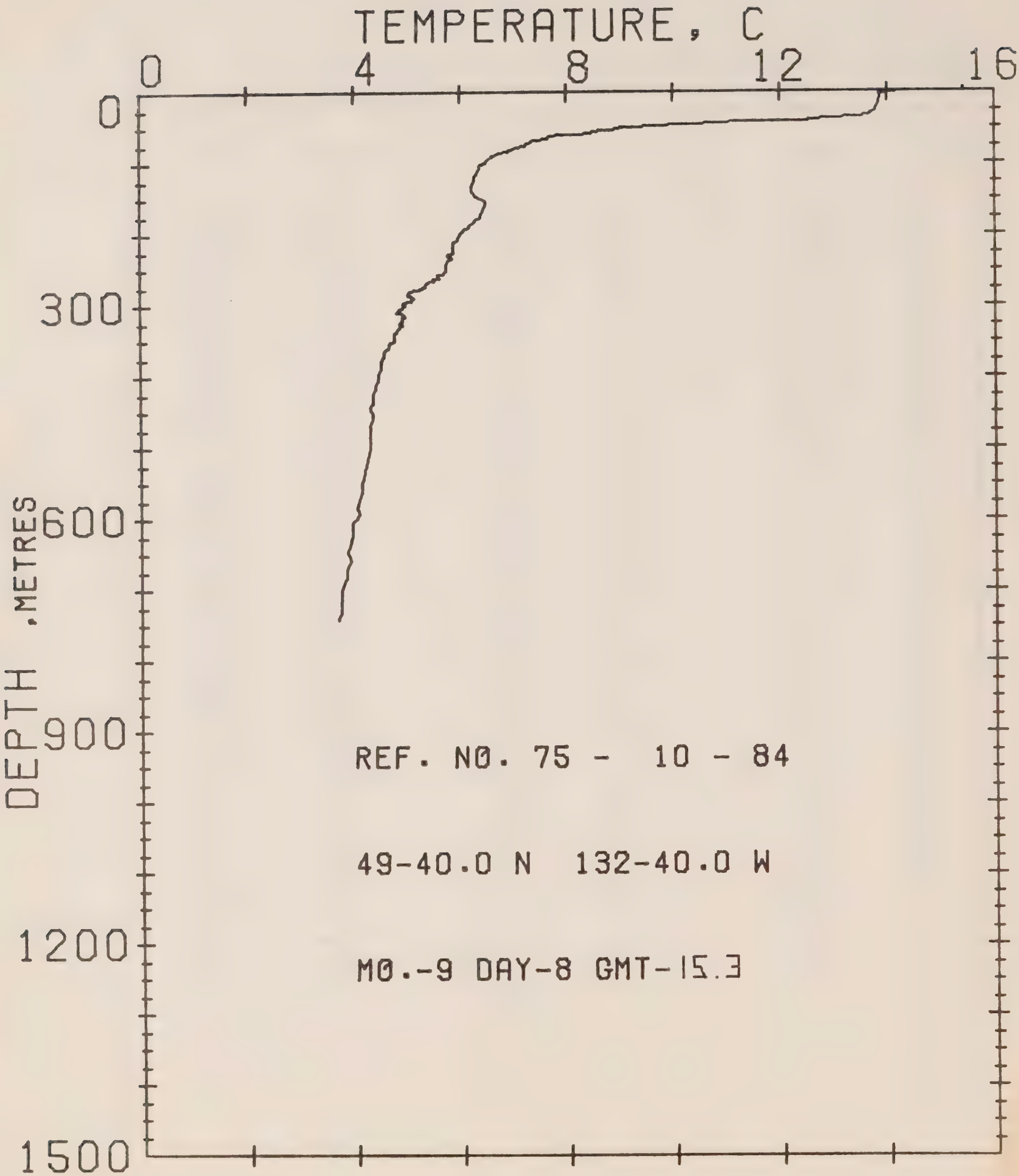
DEPTH ,METRES
REF. NO. 75 - 10 - 83
50-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-11.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 33   DATE 8/ 9/75
POSITION 50-10.0N 132-40.0W   GMT 11.8
RESULTS OF XBT CAST 104 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.86	88	6.59	310	5.26
2	13.52	94	6.59	316	5.26
6	13.52	103	6.59	320	5.23
11	13.52	113	6.59	326	5.12
14	13.47	114	6.64	335	5.18
17	13.47	119	6.59	340	5.12
19	13.47	122	6.59	346	5.07
20	13.42	124	6.64	353	5.01
22	13.42	128	6.64	360	4.96
24	13.32	135	6.64	369	4.90
25	13.16	138	6.69	382	4.79
26	12.91	144	6.75	392	4.66
27	12.24	150	6.80	401	4.66
29	11.78	156	6.80	403	4.63
31	10.95	167	6.80	407	4.57
32	10.54	181	6.75	413	4.63
34	10.13	192	6.64	425	4.52
36	9.50	203	6.46	432	4.52
38	8.92	214	6.32	438	4.46
40	8.50	224	6.10	439	4.46
42	8.15	228	6.10	443	4.41
45	7.76	230	5.99	453	4.41
46	7.55	236	5.94	471	4.35
49	7.50	240	5.86	489	4.30
53	7.34	243	5.88	500	4.24
55	7.23	245	5.83	529	4.18
58	7.07	246	5.83	550	4.18
60	6.91	254	5.77	576	4.13
62	6.91	266	5.67	608	4.07
67	6.80	275	5.61	633	4.07
72	6.75	287	5.56	665	4.02
75	6.69	294	5.50	696	3.91
78	6.69	299	5.45	718	3.91
81	6.64	302	5.39	739	3.85
85	6.59	307	5.39		


TEMPERATURE, C
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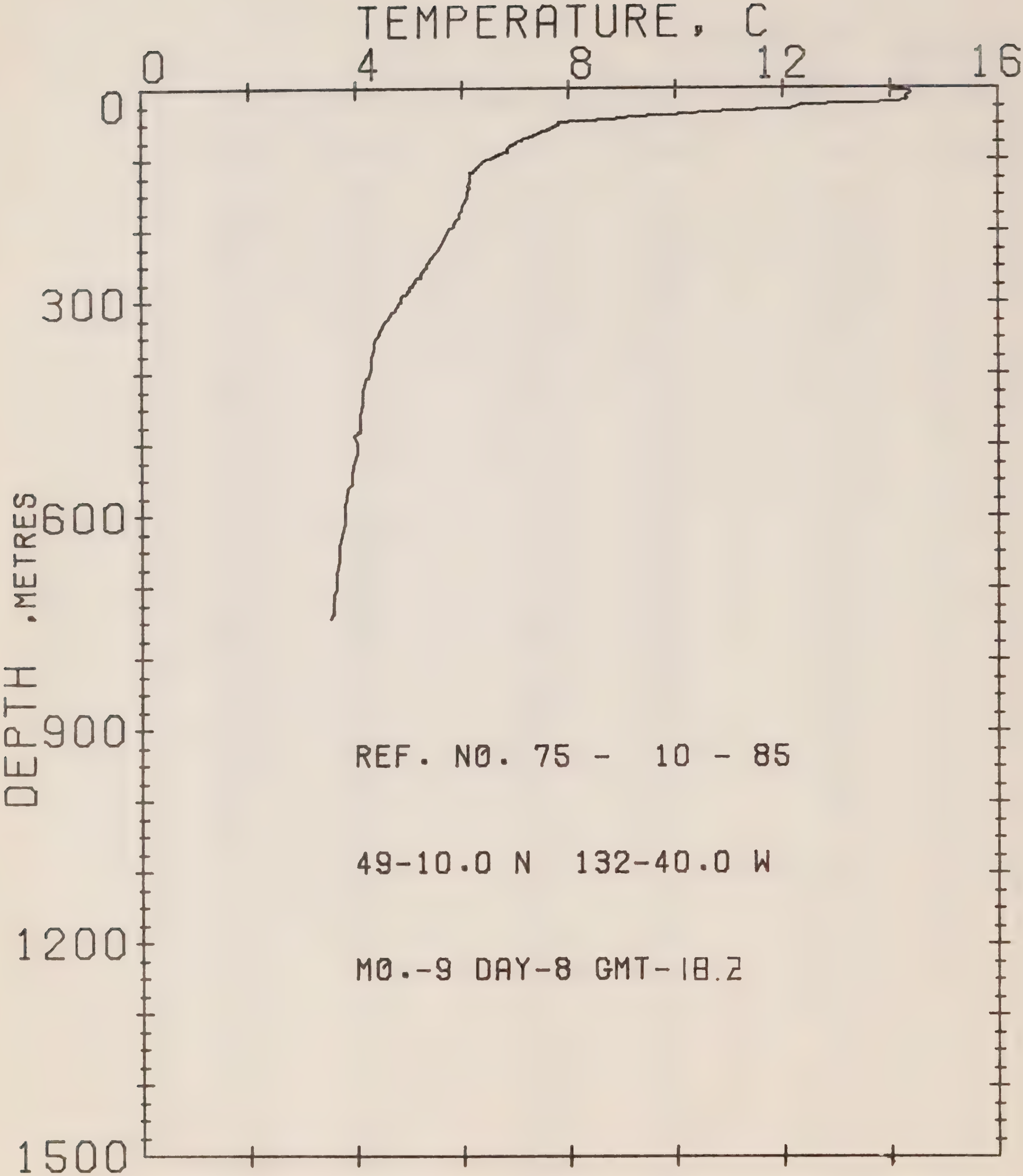
DEPTH ,METRES
REF. NO. 75 - 10 - 84
49-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-15.3

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 64   DATE 8/ 9/75
POSITION 49-40.0N 132-40.0W   GMT 15.3
RESULTS OF XBT CAST   144 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.13	165	6.42	332	4.85
3	13.83	175	6.37	337	4.79
10	13.88	181	6.26	340	4.74
16	13.83	190	6.15	344	4.74
28	13.77	196	6.05	349	4.74
33	13.67	201	5.99	354	4.68
35	13.52	208	5.94	357	4.68
36	13.26	213	5.88	360	4.63
37	13.11	220	5.88	366	4.57
38	12.86	226	5.88	371	4.57
39	12.70	230	5.77	379	4.52
41	12.34	234	5.83	389	4.52
42	11.98	239	5.77	398	4.46
43	11.16	245	5.72	405	4.46
44	10.95	250	5.72	411	4.41
46	10.23	252	5.72	418	4.41
47	10.02	255	5.67	423	4.35
48	9.86	256	5.61	430	4.35
49	9.66	257	5.56	434	4.35
50	9.24	259	5.56	438	4.35
51	9.03	261	5.61	442	4.30
53	8.87	263	5.50	448	4.30
55	8.66	266	5.50	452	4.35
57	8.45	269	5.39	459	4.35
59	8.24	271	5.34	471	4.30
61	7.92	274	5.34	485	4.30
62	7.71	275	5.28	501	4.30
66	7.65	278	5.23	516	4.24
68	7.44	279	5.12	534	4.18
70	7.34	283	5.01	552	4.13
75	7.23	285	5.01	562	4.13
79	7.07	286	5.01	573	4.07
84	6.91	288	5.07	585	4.02
87	6.75	290	5.12	592	4.07
93	6.59	293	5.07	600	4.02
99	6.46	296	4.96	606	3.96
102	6.42	298	4.90	620	3.96
105	6.37	300	4.96	631	3.91
107	6.37	303	4.90	647	3.85
116	6.32	304	4.85	659	3.91
120	6.26	306	4.85	671	3.85
124	6.26	310	4.79	684	3.85
133	6.21	312	4.90	690	3.80
140	6.21	315	4.96	703	3.74
144	6.26	317	4.90	712	3.74
147	6.26	323	4.90	722	3.74
153	6.48	325	4.85	732	3.74
158	6.48	328	4.90	741	3.68


TEMPERATURE, C
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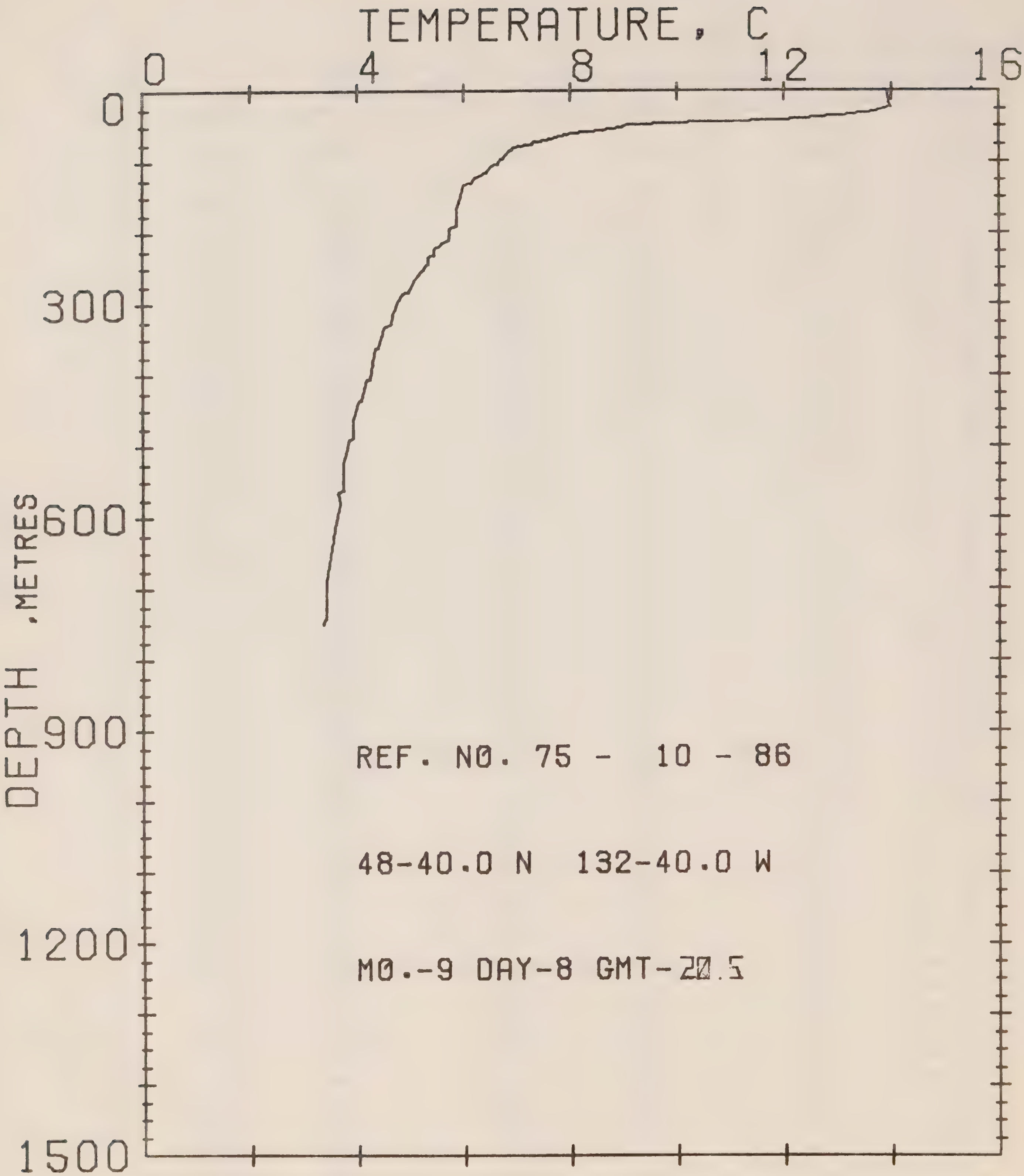
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 85
49-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-18.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 85 DATE 8/ 9/75
POSITION 49-10.0N 132-40.0W GMT 18.2
RESULTS OF XBT CAST 133 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
0	14.03	95	6.64	295	4.85
4	14.03	98	6.59	299	4.85
5	14.33	99	6.53	303	4.79
9	14.38	101	6.42	306	4.79
13	14.28	106	6.37	310	4.74
15	14.33	110	6.32	312	4.74
17	14.33	114	6.26	315	4.68
19	14.28	118	6.21	318	4.68
20	14.13	119	6.15	320	4.63
21	13.47	121	6.15	333	4.52
22	13.01	126	6.15	343	4.46
23	12.65	131	6.15	356	4.35
24	12.34	137	6.10	366	4.35
30	12.14	140	6.15	379	4.30
31	11.78	146	6.10	393	4.30
32	11.21	149	6.10	406	4.24
34	10.54	153	6.10	409	4.18
36	10.33	159	6.05	426	4.13
38	9.76	166	5.99	444	4.13
40	9.19	172	5.99	459	4.07
42	9.03	176	5.94	470	4.07
45	8.77	182	5.94	475	4.07
46	8.34	188	5.88	482	4.07
47	8.24	193	5.83	484	4.02
48	7.81	199	5.77	487	3.96
49	7.87	210	5.67	498	4.02
52	7.81	221	5.61	513	4.02
54	7.76	237	5.45	529	3.96
56	7.71	242	5.39	543	3.91
57	7.65	245	5.39	556	3.91
59	7.60	248	5.34	563	3.85
60	7.55	252	5.34	585	3.80
62	7.50	255	5.28	612	3.80
65	7.44	257	5.28	627	3.74
68	7.34	261	5.23	641	3.68
71	7.12	265	5.23	662	3.68
74	7.12	267	5.18	681	3.63
76	7.01	270	5.12	694	3.63
78	7.01	273	5.12	703	3.63
80	6.96	277	5.07	713	3.57
83	6.91	280	5.01	724	3.57
87	6.85	284	5.01	735	3.57
89	6.85	288	4.96	739	3.57
93	6.75	289	4.96	745	3.52
94	6.69				


TEMPERATURE, C
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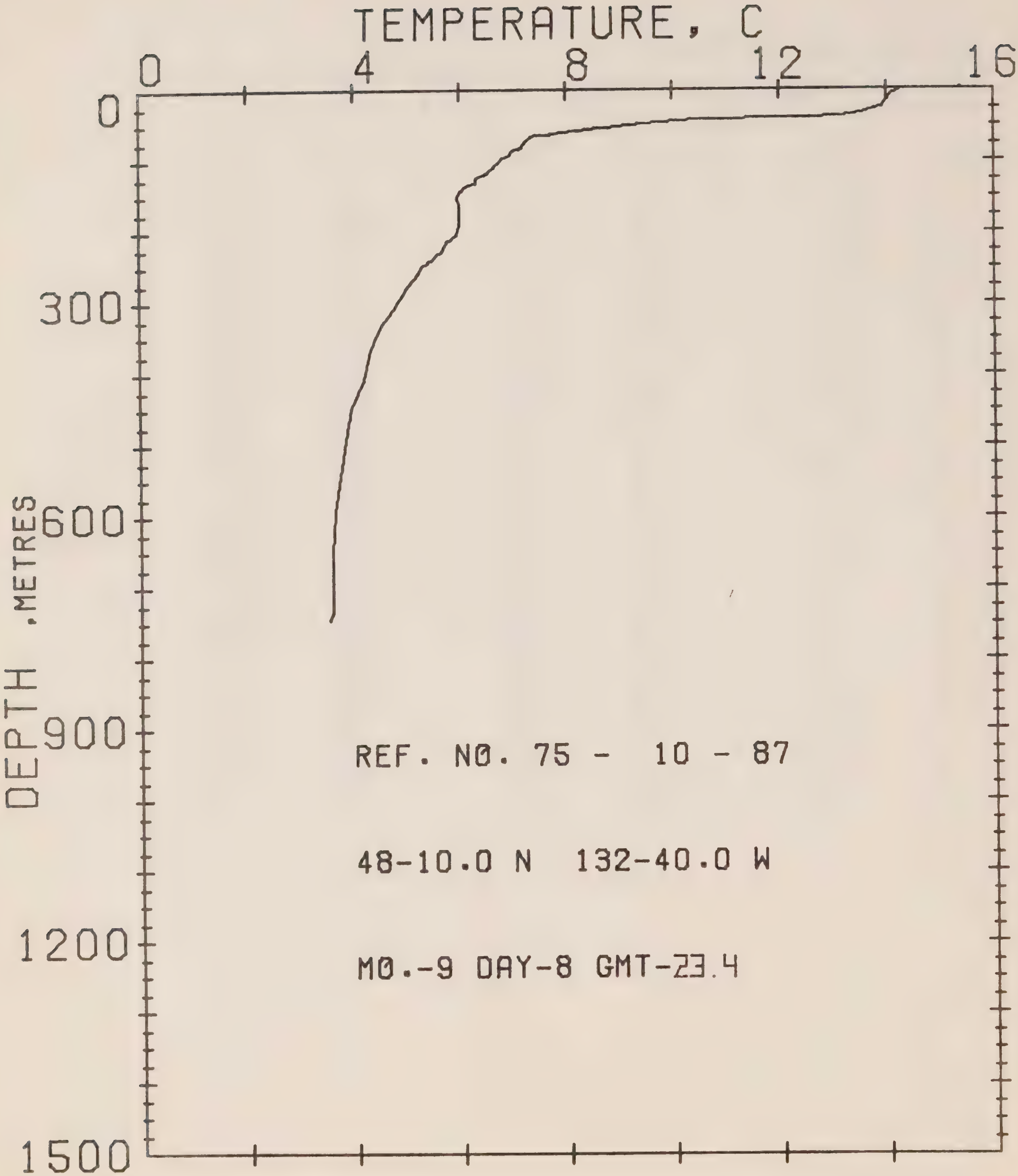
DEPTH ,METRES
REF. NO. 75 - 10 - 86
48-40.0 N 132-40.0 W
MO.-9 DAY-8 GMT-20.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 86 DATE 8/ 9/75
POSITION 48-40.0N 132-40.0W GMT 20.5
RESULTS OF XBT CAST 80 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	13.93	106	6.53	382	4.30
12	13.93	116	6.42	405	4.24
13	13.98	123	6.21	407	4.18
19	13.93	130	6.15	436	4.07
24	13.96	132	5.99	438	4.02
26	13.85	150	5.94	460	3.96
30	13.72	169	5.88	463	3.91
35	13.01	189	5.88	468	3.91
38	12.55	194	5.72	491	3.85
40	12.45	209	5.72	511	3.80
44	11.01	216	5.56	523	3.74
45	10.44	224	5.45	550	3.74
46	10.02	232	5.45	562	3.74
49	9.08	233	5.34	566	3.63
52	8.98	245	5.34	579	3.63
53	8.77	258	5.19	598	3.63
56	8.61	269	5.07	616	3.57
59	8.03	285	4.96	644	3.52
71	7.44	286	4.85	645	3.52
73	7.34	295	4.79	666	3.46
75	7.28	301	4.74	691	3.41
78	7.01	315	4.68	710	3.41
84	6.91	327	4.63	729	3.41
85	6.85	333	4.52	741	3.41
95	6.75	348	4.45	748	3.35
97	6.69	361	4.41	749	3.35
104	6.64	362	4.35		


TEMPERATURE, C
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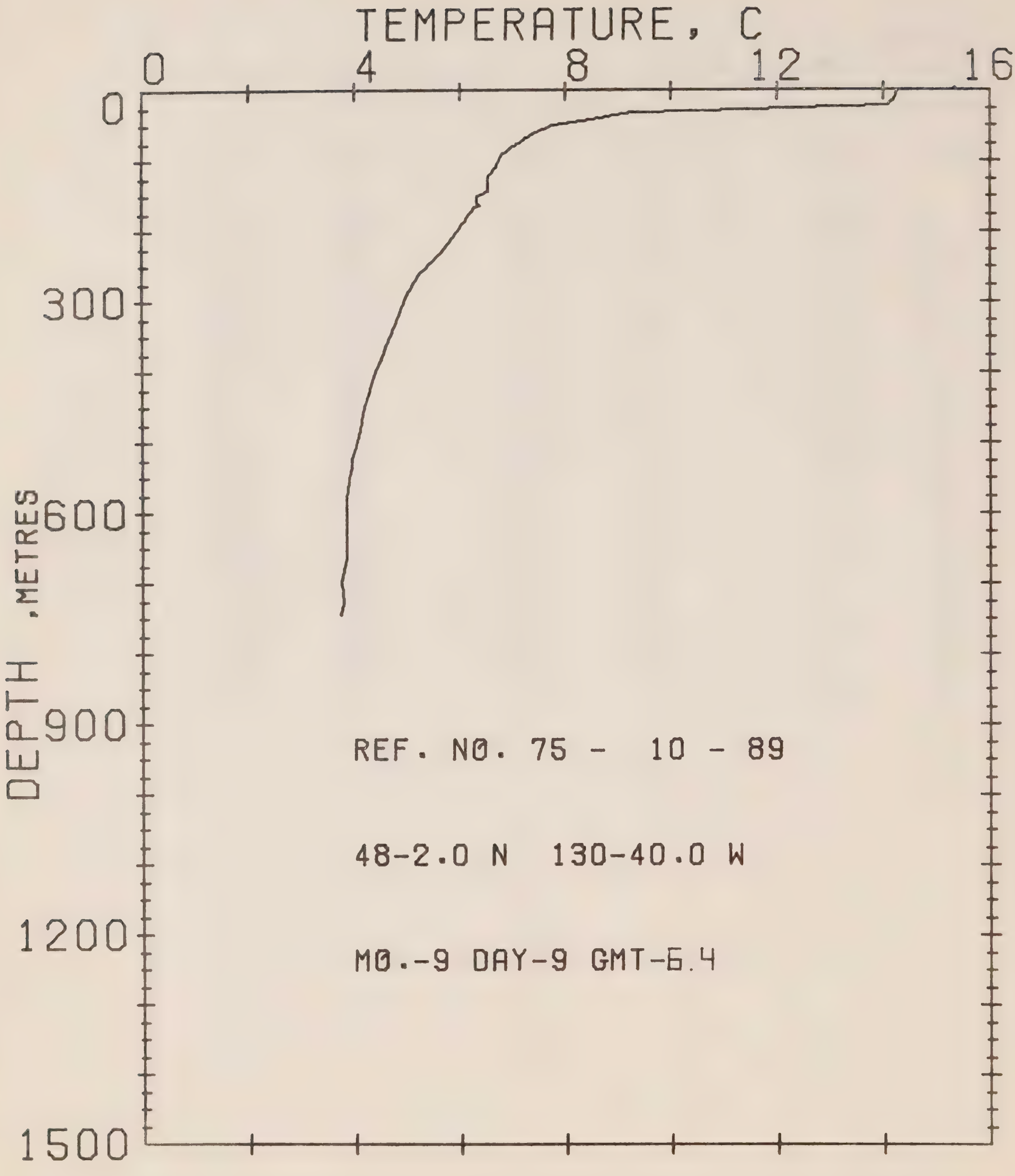
DEPTH ,METRES
REF. NO. 75 - 10 - 87
48-10.0 N 132-40.0 W
MO.-9 DAY-8 GMT-23.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 87 DATE 8/ 9/75
POSITION 48-10.0N 132-40.0W GMT 23.4
RESULTS OF XBT CAST 64 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.23	62	7.76	214	5.77
5	14.18	63	7.71	226	5.67
10	14.08	65	7.44	243	5.39
15	14.03	69	7.34	249	5.28
20	13.98	75	7.23	258	5.23
25	13.93	82	7.18	278	5.01
29	13.77	84	7.12	303	4.79
32	13.62	87	7.01	327	4.57
36	13.42	92	6.96	349	4.41
38	13.06	98	6.80	373	4.30
39	12.55	109	6.64	408	4.16
40	11.76	118	6.53	448	3.96
42	10.90	124	6.32	492	3.85
43	10.38	131	6.32	518	3.80
44	10.23	135	6.15	567	3.68
45	10.18	142	6.05	593	3.63
46	9.76	144	5.99	653	3.57
51	9.19	154	5.94	689	3.57
53	8.77	159	5.99	735	3.57
55	8.61	189	5.99	743	3.52
57	8.24	204	5.94	746	3.52
58	8.19				


TEMPERATURE, C
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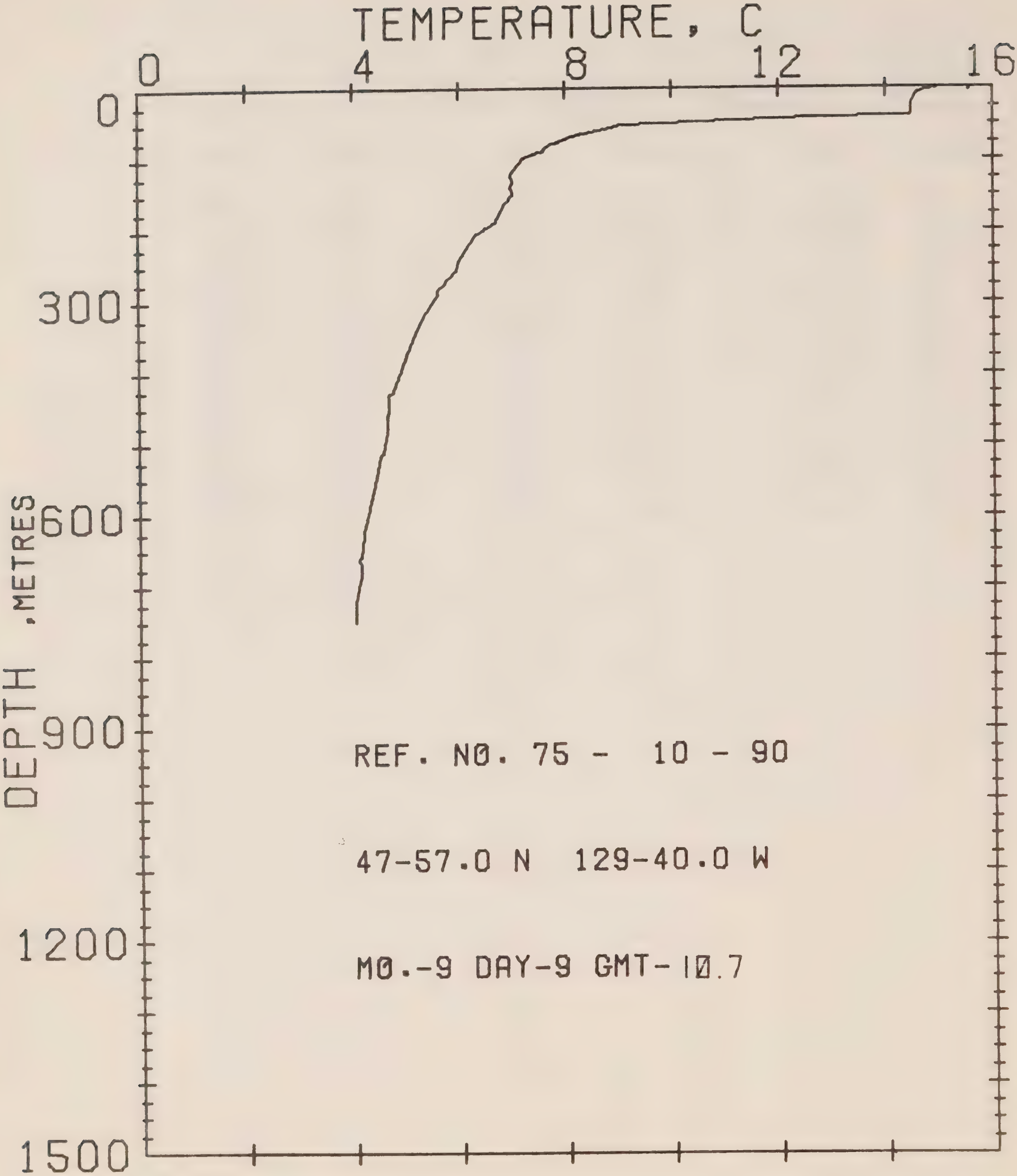
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 89
48-2.0 N 130-40.0 W
MO.-9 DAY-9 GMT-6.4

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 59 DATE 9/ 9/75
POSITION 48- 2.0N 130-40.0W GMT 6.4
RESULTS OF XBT CAST 42 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.26	109	6.69	355	4.65
7	14.23	123	6.53	382	4.52
15	14.16	132	6.53	400	4.41
17	14.18	144	6.53	451	4.18
19	14.13	151	6.32	491	4.07
21	14.08	158	6.32	524	3.96
24	13.21	162	6.32	536	3.96
30	10.44	164	6.37	540	3.91
33	9.24	167	6.26	580	3.85
41	8.50	197	5.99	628	3.85
50	7.76	229	5.67	664	3.85
62	7.39	262	5.23	700	3.74
77	7.07	297	4.96	728	3.80
93	6.80	329	4.79	743	3.74


TEMPERATURE, C
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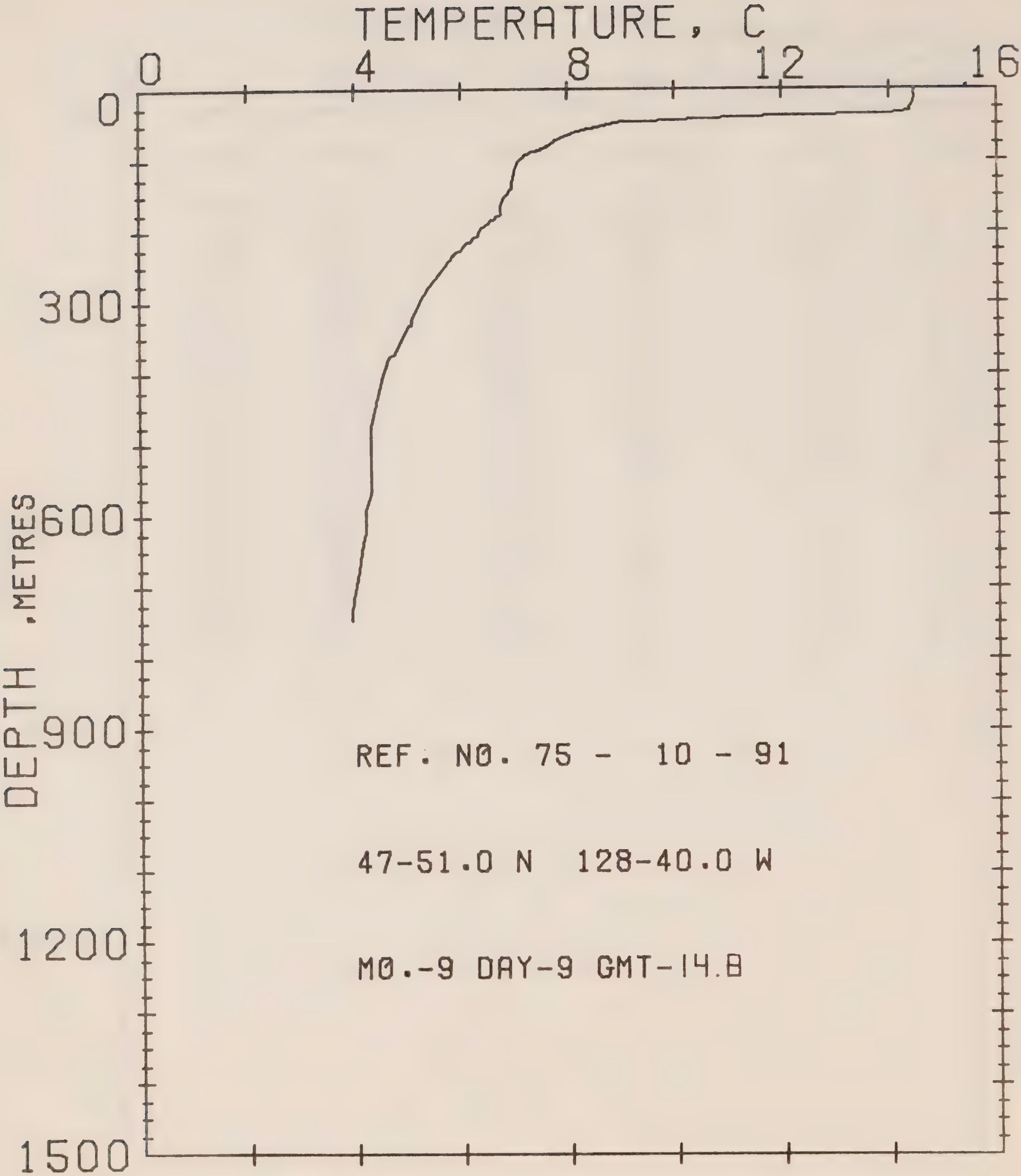
DEPTH ,METRES
REF. NO. 75 - 10 - 90
47-57.0 N 129-40.0 W
MO.-9 DAY-9 GMT-10.7

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 90 DATE 9/ 9/75
POSITION 47-57.0N 129-40.0W GMT 10.7
RESULTS OF XBT CAST 59 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.94	123	6.96	430	4.68
3	14.74	130	7.01	481	4.63
10	14.59	135	7.01	513	4.57
17	14.54	139	6.96	516	4.52
27	14.49	147	7.01	557	4.41
32	14.49	150	7.01	590	4.30
37	14.49	164	6.85	605	4.24
39	14.44	187	6.69	623	4.18
40	14.26	207	6.32	627	4.18
43	12.70	224	6.15	658	4.13
48	10.44	242	5.99	661	4.07
52	9.08	256	5.94	664	4.07
54	8.96	262	5.88	667	4.13
67	8.13	285	5.61	684	4.13
76	7.87	291	5.61	703	4.07
80	7.71	320	5.34	723	4.02
88	7.60	345	5.18	739	4.02
93	7.44	374	5.01	746	4.02
98	7.23	407	4.85	749	4.02
117	7.01	426	4.74		


TEMPERATURE, C
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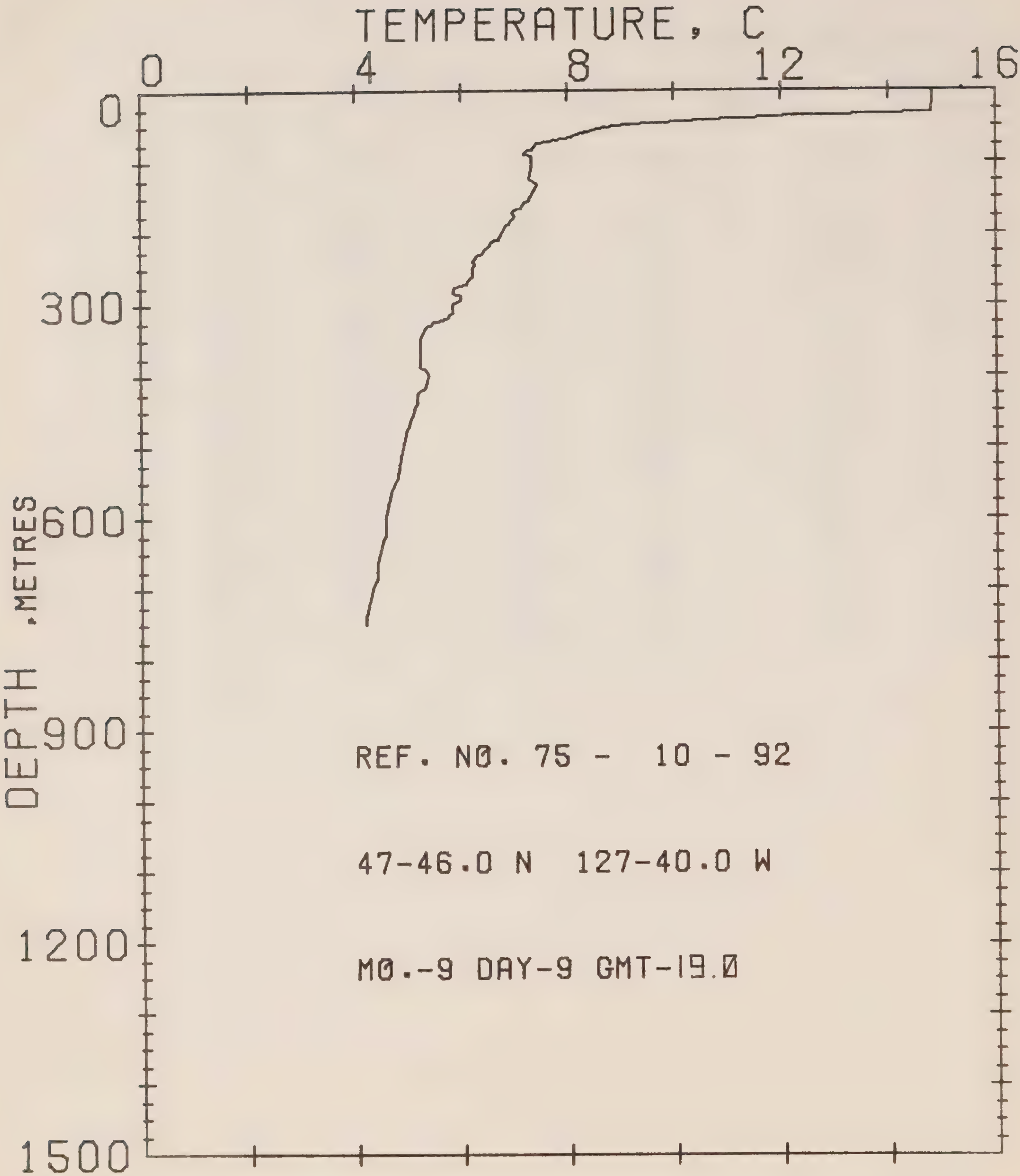
DEPTH ,METRES
REF. N0. 75 - 10 - 91
47-51.0 N 128-40.0 W
M0.-9 DAY-9 GMT-14.8

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 91   DATE 9/ 9/75
POSITION 47-51.0N 128-40.0W   GMT 14.8
RESULTS OF XBT CAST   56 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	14.49	95	7.18	324	5.07
7	14.44	105	7.07	331	5.07
13	14.49	116	7.01	335	5.01
20	14.44	131	6.96	372	4.74
28	14.38	141	6.96	377	4.63
33	14.38	154	6.80	409	4.52
36	13.98	165	6.75	441	4.41
38	12.09	170	6.75	477	4.30
42	10.49	176	6.75	528	4.30
46	9.45	181	6.64	568	4.30
47	9.03	187	6.53	591	4.18
48	8.92	196	6.37	624	4.18
55	8.55	206	6.32	639	4.13
61	8.19	213	6.21	665	4.07
66	7.92	223	6.05	687	4.02
74	7.76	235	5.88	717	3.96
82	7.60	259	5.61	737	3.91
86	7.50	280	5.39	746	3.91
91	7.28	301	5.23		


TEMPERATURE, C
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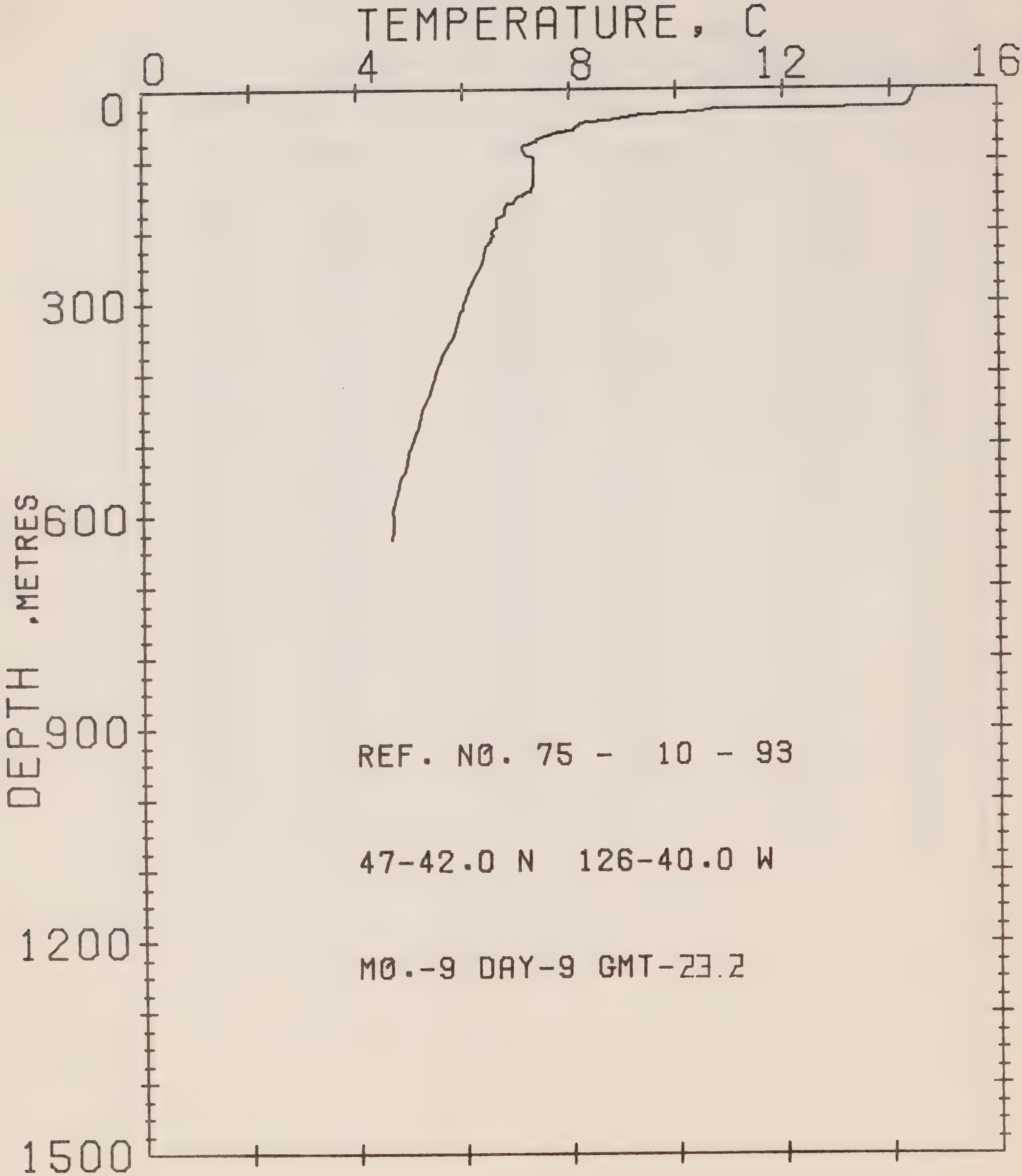
DEPTH ,METRES
REF. NO. 75 - 10 - 92
47-46.0 N 127-40.0 W
MO.-9 DAY-9 GMT-19.0

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 92 DATE 9/ 9/75
POSITION 47-46.0N 127-40.0W GMT 19.0
RESULTS OF XBT CAST 62 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	14.84	165	7.12	321	5.67
7	14.84	167	7.01	324	5.50
19	14.84	172	6.96	327	5.45
26	14.79	175	7.01	334	5.34
32	14.79	187	6.91	348	5.23
33	14.74	190	6.85	366	5.23
35	12.86	204	6.75	381	5.23
36	12.24	209	6.69	389	5.23
38	11.88	212	6.59	394	5.34
42	10.54	218	6.53	401	5.39
45	10.18	225	6.42	416	5.34
48	9.13	236	6.26	425	5.18
52	8.71	240	6.21	439	5.18
62	8.19	245	6.26	447	5.12
66	8.08	251	6.21	479	4.96
72	7.65	257	6.21	516	4.85
74	7.44	261	6.21	542	4.79
84	7.34	265	6.15	565	4.68
86	7.23	271	6.10	600	4.57
91	7.18	275	5.88	626	4.57
93	7.34	283	5.83	632	4.52
108	7.34	287	5.99	666	4.41
110	7.34	295	5.99	689	4.41
124	7.28	300	5.83	693	4.35
132	7.44	307	5.83	723	4.24
141	7.39	313	5.83	741	4.18
155	7.28	318	5.77	749	4.18
160	7.18				


TEMPERATURE, C
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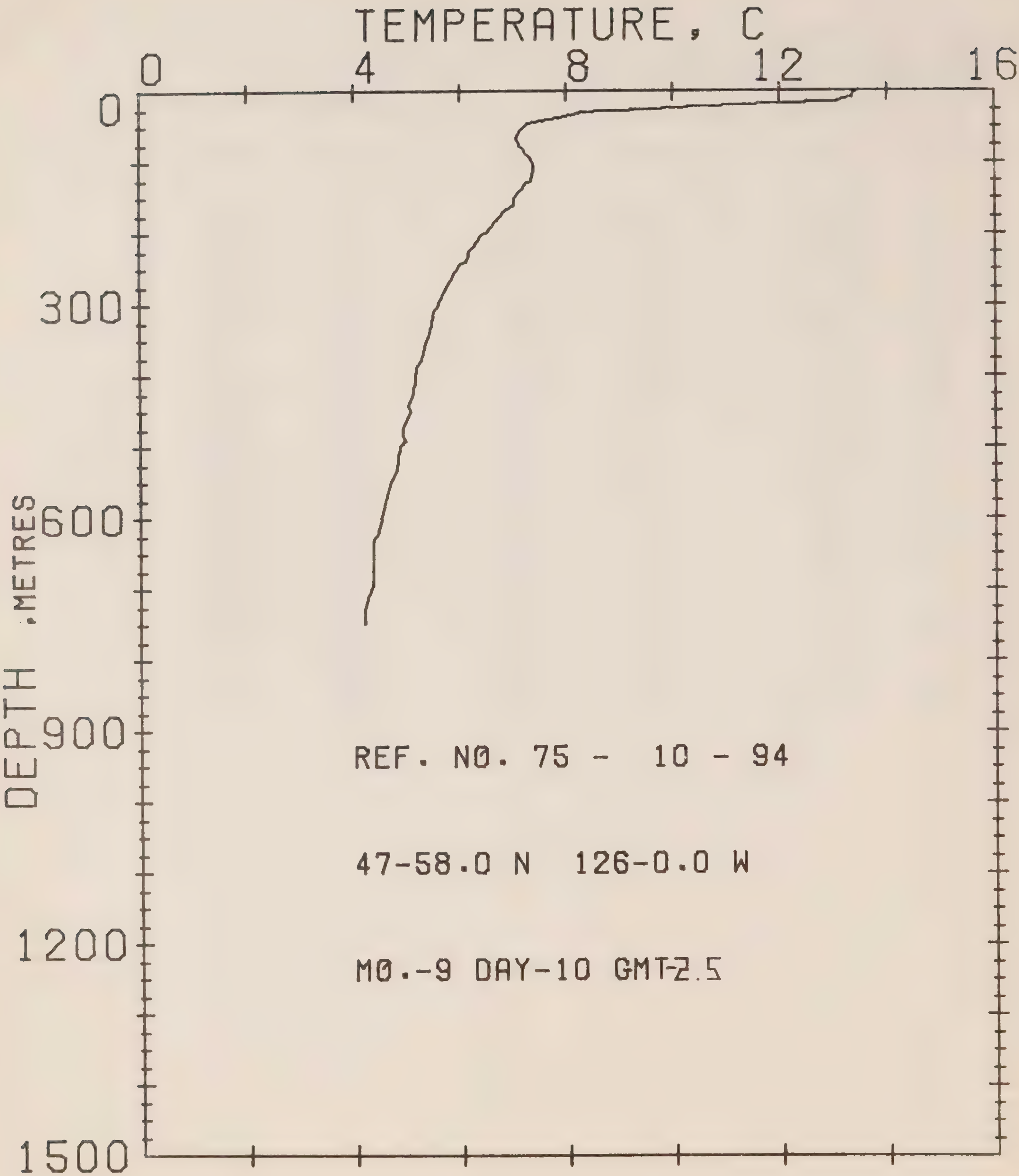
1200
1500
DEPTH ,METRES
REF. NO. 75 - 10 - 93
47-42.0 N 126-40.0 W
MO.-9 DAY-9 GMT-23.2

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 93 DATE 9/ 9/75
POSITION 47-42.0N 126-40.0W GMT 23.2
RESULTS OF XBT CAST 66 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
2	14.49	93	7.18	222	6.42
4	14.44	97	7.34	247	6.37
20	14.38	109	7.34	265	6.21
23	14.33	120	7.34	285	6.10
25	14.28	135	7.34	303	5.99
28	12.09	143	7.28	309	5.99
29	10.75	146	7.18	314	5.94
32	10.49	150	7.12	347	5.83
36	9.39	152	7.01	376	5.61
44	8.71	159	6.96	398	5.50
47	8.40	161	6.85	425	5.39
49	8.24	167	6.80	450	5.23
52	8.19	171	6.80	471	5.18
55	8.13	175	6.80	491	5.07
57	8.08	183	6.64	513	4.96
59	7.81	187	6.64	535	4.90
68	7.50	193	6.64	548	4.79
72	7.39	202	6.53	569	4.74
74	7.39	207	6.59	595	4.63
76	7.28	210	6.53	603	4.63
80	7.12	214	6.53	622	4.68
85	7.12	218	6.48	631	4.63


TEMPERATURE, C
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DEPTH ,METRES
REF. NO. 75 - 10 - 94
47-58.0 N 126-0.0 W
MO.-9 DAY-10 GMT-2.5

OFFSHORE OCEANOGRAPHY
REFERENCE NO. 75- 10- 94 DATE 10/ 9/75
POSITION 47-58.0N 126- 0.0W GMT 2.5
RESULTS OF XBT CAST 66 POINTS TAKEN FROM ANALOG TRACE

DEPTH	TEMP	DEPTH	TEMP	DEPTH	TEMP
1	13.42	125	7.34	435	5.07
3	13.37	133	7.23	441	5.01
8	13.37	152	7.01	449	5.07
10	13.32	159	7.01	458	5.01
12	13.21	168	6.85	473	4.90
13	13.11	182	6.69	484	4.90
15	13.06	195	6.53	492	4.96
19	11.85	207	6.37	496	4.90
23	9.97	218	6.26	500	4.85
25	9.66	226	6.15	533	4.79
29	8.77	231	6.15	552	4.68
30	8.34	240	6.10	584	4.57
32	8.24	244	5.99	602	4.52
37	7.87	278	5.72	620	4.46
42	7.55	299	5.61	632	4.35
46	7.25	312	5.50	655	4.35
58	7.12	317	5.50	677	4.35
68	7.07	338	5.45	694	4.35
77	7.12	359	5.34	715	4.24
95	7.34	377	5.28	730	4.18
106	7.39	387	5.18	741	4.18
112	7.39	424	5.12	747	4.15

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

Stn.No.	Lat.(°N)	Long.(°W)	DATE	TIME	TEMP.°C (bucket)	SAL.°/oo (bucket)	SAL.°/oo (loop)
1	48° 33'	125° 33'	19-08-75	1600	12.8	31.132	31.098
2	48° 38'	126° 00'	19-08	1920	13.8	32.029	32.026
3	48° 42'	126° 40'	19-08	2200	13.5	32.114	32.097
4	48° 46'	127° 40'	20-08	0700	14.2	32.123	32.127
5	48° 51'	128° 40'	20-08	1145	15.0	32.198	32.223
5A	48° 57'	129° 40'	20-08	1650	14.5	-	32.115
6	49° 02'	130° 40'	20-08	2055	14.2	32.123	32.118
6A	49° 06'	131° 40'	21-08	0334	13.7	-	32.316
7	49° 10'	132° 40'	21-08	0720	13.7	32.086	32.076
7A	49° 14'	133° 40'	21-08	1148	-	-	32.285
8	49° 17'	134° 40'	21-08	1550	12.8	32.403	32.399
8A	49° 21'	135° 40'	21-08	2030	13.5	32.367	32.349
9	49° 26'	136° 40'	22-08	0015	12.8	32.281	32.367
9A	49° 30'	137° 40'	22-08	0430	12.5	-	32.341
10	49° 34'	138° 40'	22-08	0815	12.5	32.382	32.386
10A	49° 38'	139° 40'	22-08	1423	12.0	-	32.487
11	49° 41'	140° 40'	22-08	2210	11.7	32.481	32.485
11A	49° 45'	141° 40'	23-08	0225	11.8	-	32.489
12	49° 49'	142° 40'	23-08	0615	11.4	32.512	32.508
12A	49° 55'	143° 40'	23-08	1030	11.9	32.519	-
P	50° 00'	145° 00'	23-08	1545	11.2	32.535	32.537
13	51° 00'	145° 00'	24-08	0118	11.1	-	32.518
14	52° 00'	145° 00'	24-08	0600	10.8	32.549	32.550
15	51° 55'	143° 40'	24-08	1100	10.8	32.547	32.545
16	51° 49'	142° 40'	24-08	1430	10.7	32.590	32.574
17	51° 45'	141° 40'	24-08	1835	11.0	-	32.534
18	51° 41'	140° 40'	24-08	2140	11.2	32.532	32.528
19	51° 38'	139° 40'	25-08	0150	11.8	-	32.497
20	51° 34'	138° 40'	25-08	0630	11.8	32.364	32.364
21	51° 30'	137° 40'	25-08	1020	12.4	32.289	32.280
22	51° 26'	136° 40'	25-08	1330	12.4	32.369	32.359
23	51° 21'	135° 40'	25-08	1745	12.4	-	32.329
24	51° 17'	134° 40'	25-08	2125	12.6	32.312	32.301

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

Stn.No.	Lat.(°N)	Long.(°W)	DATE	TIME	TEMP.°C (bucket)	SAL.°/oo (bucket)	SAL.°/oo (loop)
25	51° 14'	133° 40'	26-08-75	0115	13.0	-	32.179
26	51° 10'	132° 40'	26-08	0430	12.8	32.117	32.128
27	51° 36'	131° 40'	26-08	0906	13.2	32.079	32.102
28	51° 48'	131° 07'	26-08	1150	11.0	32.142	32.166
29	51° 24'	130° 55'	26-08	1505	11.5	32.172	32.174
30	51° 02'	130° 40'	26-08	1735	13.2	32.016	32.014
31	50° 31'	129° 50'	26-08	2235	13.7	32.044	32.031
32	49° 51'	128° 40'	27-08	0620	12.2	31.961	32.035
33	49° 17'	127° 40'	27-08	1210	12.8	32.078	32.067
3	48° 42'	126° 40'	27-08	1900	12.6	32.029	32.024
2	48° 38'	126° 00'	27-08	2155	12.1	31.991	32.000
1	48° 33'	125° 33'	28-08	0410	10.1	32.454	32.449
34	48° 03'	125° 20'	28-08	0725	12.2	31.882	31.885
32	49° 51'	128° 40'	30-08	1600	13.8	32.005	32.002
35	49° 57'	129° 40'	31-08	0754	13.9	-	32.102
36	50° 02'	130° 40'	31-08	1108	13.8	32.123	32.107
37	50° 06'	131° 40'	31-08	1535	13.6	32.231	32.227
38	50° 10'	132° 40'	31-08	1945	13.5	32.133	32.116
39	50° 14'	133° 40'	01-09	0003	13.2	32.136	32.131
40	50° 17'	134° 40'	01-09	0400	13.7	32.160	32.160
41	50° 21'	135° 40'	01-09	0755	12.7	32.357	32.343
42	50° 26'	136° 40'	01-09	1200	12.5	32.383	32.382
43	50° 30'	137° 40'	01-09	1644	12.3	32.459	32.458
44	50° 34'	138° 40'	01-09	2045	12.0	32.426	32.409
45	50° 38'	139° 40'	02-09	0135	11.6	32.504	32.501
46	50° 41'	140° 40'	02-09	0530	11.5	32.508	32.503
47	51° 11'	140° 40'	02-09		11.5	-	32.473
18	51° 41'	140° 40'	02-09	1110	11.5	32.502	32.504
48	52° 11'	140° 40'	02-09	1419	11.1	-	32.584
49	52° 41'	140° 40'	02-09	1655	11.4	32.583	32.582
50	53° 11'	140° 40'	02-09	2002	11.4	-	32.614
51	53° 41'	140° 40'	02-09	2232	11.5	32.606	32.589

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

Stn.No.	Lat.(°N)	Long.(°W)	DATE	TIME	TEMP.°C (bucket)	SAL.°/oo (bucket)	SAL.°/oo (loop)
52	54° 11'	140° 40'	03-09-75	0138	11.9	-	32.471
53	54° 41'	140° 40'	03-09	0415	11.9	32.526	32.524
54	54° 41'	139° 40'	03-09	0733	11.6	-	32.446
55	54° 41'	138° 40'	03-09	1030	12.0	32.452	32.441
56	54° 41'	137° 40'	03-09	1417	12.0	-	32.449
57	54° 41'	136° 40'	03-09	1730	12.2	32.501	32.501
58	54° 41'	135° 40'	03-09	2055	12.3	32.464	32.457
59	54° 41'	134° 40'	04-09	0025	12.6	32.257	32.262
60	54° 41'	134° 05'	04-09	0250	11.7	31.378	31.355
61	54° 38'	133° 29'	04-09	0519	11.9	30.765	30.765
62	54° 20'	133° 14'	04-09	0725	12.5	32.231	32.216
63	53° 14'	133° 40'	05-09	1029	13.0	32.174	32.177
64	53° 17'	134° 40'	05-09	1510	12.4	32.289	32.287
65	53° 21'	135° 40'	05-09	1915	12.0	-	32.444
66	53° 26'	136° 40'	05-09	2220	12.2	32.281	32.281
67	53° 30'	137° 40'	06-09	0225	11.8	-	32.455
68	53° 34'	138° 40'	06-09	0554	11.7	32.458	32.458
69	53° 38'	139° 40'	06-09	1025	11.8	-	32.478
51	53° 41'	140° 40'	06-09	1425	10.8	32.585	32.583
70	53° 07'	139° 40'	06-09	1955	10.8	32.286	-
71	52° 34'	138° 40'	07-09	0010	11.5	32.499	32.501
72	52° 30'	137° 40'	07-09	0330	11.6	32.520	32.520
73	52° 26'	136° 40'	07-09	0655	12.1	32.325	32.326
74	52° 21'	135° 40'	07-09	1032	12.0	32.357	32.325
75	52° 17'	134° 40'	07-09	1415	12.4	32.289	32.287
76	52° 14'	133° 40'	07-09	1800	13.0	32.071	32.066
77	52° 10'	132° 40'	07-09	2310	13.2	32.138	32.132
78	51° 40'	132° 40'	08-09	0220	13.1	32.317	32.315
26	51° 10'	132° 40'	08-09	0520	13.2	32.163	32.163
79	50° 40'	132° 40'	08-09	0812	13.0	32.212	32.199
38	50° 10'	132° 40'	08-09	1110	13.2	32.109	32.106

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

Stn.No.	Lat.(°N)	Long.(°W)	DATE	TIME	TEMP.°C (bucket)	SAL.°/oo (bucket)	SAL.°/oo (loop)
7	49° 10'	132° 40'	08-09-75	1739	13.7	32.153	32.153
81	48° 40'	132° 40'	08-09	1958	13.9	32.299	32.297
82	48° 10'	132° 40'	08-09	2240	14.2	32.452	32.446
83	48° 06'	131° 40'	09-09	0200	14.0	32.474	32.468
84	48° 02'	130° 40'	09-09	0556	14.0	32.292	32.290
85	47° 57'	129° 40'	09-09	0958	14.2	32.438	32.449
86	47° 51'	128° 40'	09-09	1420	14.1	32.157	32.155
87	47° 46'	127° 40'	09-09	1833	14.8	32.182	32.169
88	47° 42'	126° 40'	09-09	2237	14.5	32.104	32.103
89	47° 58'	126° 00'	10-09	0200	13.4	31.688	31.688
90	48° 27'	124° 51'	10-09	0711	11.0	32.045	32.067

Pacific Marine Science Report 78-8

OBSERVATIONS OF SEAWATER TEMPERATURE AND SALINITY AT BRITISH COLUMBIA SHORE STATIONS 1975

by

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1978

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Abstract

Surface (approx. 1-metre) oceanic salinity and/or temperature have been recorded daily at several locations along the coast of British Columbia for varying lengths of time - from a few months to a few decades. At present, such data are being gathered at sixteen places - of which fifteen are Ministry of Transport lightstations, the remaining one being the Pacific Biological Station, Departure Bay. Temperatures are determined at all sites by means of mercury-in-glass thermometers; salinities are obtained at fourteen sites only, by means of hydrometers. The data so obtained during each calendar year are published in two forms. Firstly, tables provide, for each site, the monthly means and the associated standard deviations, as well as the maximum and minimum values recorded during each month; the annual means are also listed. Secondly, graphs indicate the behaviour, throughout the year, of the data after the higher-frequency oscillations (e.g., those of tidal period) have been removed ("smoothed") by means of a seven-day normally-weighted running mean.

This publication presents the data obtained in 1975.

Introduction

Daily observations of sea-surface temperature and salinity have been made since the early 1930s at numerous locations along the British Columbia coast. During 1975 observations were made at 16 shore stations (page 6). Table 1 lists these stations in north-to-south order along the "outside coast" (Langara Island to Race Rocks) and along the Strait of Georgia (Cape Mudge to Active Pass). The general location of each station, as well as the names of the observers that participated, are also noted. Most of the sampling sites are at lightstations, and the voluntary services of the lightkeepers as observers have been obtained by arrangement with the Ministry of Transport. The Cape St. James station is a combined radiobeacon and meteorological station, and the services of the staff there have been obtained through the kind permission of the Regional Director, Atmospheric Environment Service. The observers at the lightstations receive a payment from Ocean and Aquatic Sciences, of the Department of Fisheries and the Environment, for their work.

This report presents the seawater data obtained from these shore stations during 1975.

Observational Equipment and Procedures

Except at Active Pass, each daily observation is made within one hour before (and as near as possible to) the occurrence of the daytime high tide. The exact time is dependent both upon weather conditions and upon the press of the observer's lightkeeping duties. At Active Pass, observations are made at daylight high-water slack as obtained from the Canadian Tide and Current Tables (Canadian Hydrographic Service, 1975). No sampling is attempted in darkness at any station.

Temperatures are measured by means of a mercury-in-glass thermometer recording within the range 10° to 140° Fahrenheit (F); it is graduated in 1° F intervals. Each thermometer is checked against a calibrated thermometer; the maximum allowable error is taken to be ±0.4°F (±0.2°C). The seawater temperatures are estimated to 0.1°F. The thermometer, (partially) enclosed in a protective case of 1-in (2.5-cm) aluminum pipe, is attached to the end of a pole (also made of aluminum pipe) which can be as long as about 20 ft (6 m). The thermometer is lowered into the water to a depth of 3 ft (about 1 m) and left at that depth for two minutes. The greatest pole lengths are necessary at sites where observations are carried out from steep ledges. At some stations, water samples are obtained by bucket during inclement weather.

At every station except Sheringham Point and Cape St. James[1], a 25-oz (710-cc) glass or plastic bottle is also attached to the pole. At the same time that the temperature of the seawater is recorded, a sample is drawn from this bottle, for use in the measurement of density by means of a hydrometer. The hydrometers employed are similar to those used by the U.S. Coast and Geodetic Survey (USC&GS) at its tidal stations. (Since 1970, the

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[1] Density (and, therefore, salinity) measurements were terminated at Sheringham Point on 31 March 1970 and at Cape St. James on 31 May 1971.

USC&GS has been a part of the National Ocean Surveys of the National Oceanic and Atmospheric Administration (NOAA).)

Hydrometers actually measure the *specific gravity* of a seawater sample. Specific gravity is a ratio of two densities and is therefore a dimensionless quantity. If however, by definition, distilled water at a temperature of 39.2°F (4°C) has a density $\rho_m = 1$, then the specific gravity of a substance having density ρ is ρ/ρ_m and is numerically equal to the value of ρ.

The density (or specific gravity) of a seawater sample depends upon both the quantity of dissolved material in the sample (the "salinity") and the sample temperature at the time the measurement is made. Densities determined by hydrometer without temperature control must therefore be reduced to some "standard" temperature for conversion to the corresponding salinities. The standard adopted for this program is 15°C (59°F), the same as that presently in use by the USC&GS.

An expression of the general form *Sp. Gr. Tp. (or Temp.)* 15/4°C is provided on every hydrometer utilized in this program. It incorporates both the basis of specific gravity (distilled water at <u>4°C</u> (29.2°F)) and the standard temperature (<u>15</u>°C or 59°F) employed.

Hydrometers are supplied to the stations in one or more of three ranges of specific gravity: 0.9960 - 1.0110, 1.0100 - 1.0210, and 1.0200 - 1.0310. The scales are divided into intervals of 0.0002, and the instruments are believed accurate to ±0.0001. The hydrometers are read employing techniques described by the USC&GS (Adams, 1942). Each instrument has its calibration checked immediately before being sent to a station.

The time of each daily observation, and the associated seawater temperature and hydrometer readings, are recorded on monthly field sheets. At present, such sheets are mailed to the Pacific Environment Institute, West Vancouver, British Columbia, every two months for preliminary processing.

Preliminary Processing of the Data

This stage consists of several operations. The temperature data are scanned, and values are rejected if it is discovered that a faulty thermometer has been used, or if the value is obviously the result of a misreading or of any other error in technique. The accuracy of "good" individual readings should be within ±0.4°F (±0.2°C). The observed hydrometer readings are reduced to densities at the standard temperature, 15°C (59°F), by means of tables prepared by the USC&GS (Zerbe and Taylor, 1953). The appropriate calibration correction is then applied to each such density value. These corrected values are in turn converted to salinities. A salinity is rejected, again, only if obviously due to misreading of the hydrometer or to other procedural errors. It may be noted that comparisons involving several dozen samples collected at B.C. shore stations have indicated that about 85% of the "hydrometer" salinity data agreed, to within ±0.3°/₀₀, with the corresponding values determined by laboratory salinometer (Hollister, unpublished).

If observations are missing for *one* day or for *two consecutive* days, the resulting gap is filled by value(s) obtained by linear interpolation utilizing the two observations bounding the gap. No interpolated values are provided when readings are missed for *three or more* consecutive days (whether by accident or by design).

Machine Processing of the Data

For each calendar year, the daily temperature and salinity data remaining after the preliminary procedures noted above are processed into final form by the Marine Environmental Data Service (MEDS) of Ocean and Aquatic Sciences, Department of Fisheries and the Environment, Ottawa. For each station, this machine processing involves the computation of the twelve monthly means for temperature and for salinity, as well as of the corresponding standard deviations. The annual means are also determined. All means are rounded off to the first decimal place, and the standard deviations are truncated at the second decimal place. Data obtained by interpolation are *not* utilized in the computation of the means.

A form of smoothing has been performed on the data to minimize the effect of any variability associated with frequencies large compared to the annual frequency (those associated with tides, for example). For simplicity, the daily values at each sampling station are here considered to be equally-spaced in time - with a sampling interval, therefore, of 24 hours. A seven-day, normally-weighted running mean (e.g., Holloway, 1958) has been utilized for smoothing; this form of filtering is considered to result in an output free of such defects as "polarity reversals" or phase shifts. The running mean is computed, for the entire year, for both temperature and salinity. In order that these means for each station be as continuous as possible consistent with the data involved, interpolated daily values *have* been utilized in the associated computations. However, when a period of greater-than-two consecutive days of missed data is encountered, the computations are interrupted.

Presentation of the Data

The first major section of this report (pp. 14 to 77) subsequent to the text tabulates, in monthly format for each shore station in 1975, the daily values of temperature in °F and of salinity in parts per thousand (ppt, °/₀₀). Three months' data are listed on each page. Also recorded for each month are the mean, the standard deviation (STD, DEV.), the number of observations (OBSVNS.) involved in the computations of these two quantities, and the maximum and minimum values. With the December values for each station are also included the *annual* means (YRLY. MEANS) for temperature and salinity. Each interpolated daily value is identified by an asterisk (*). "Missed" values with which no interpolation is associated are each denoted by a "*0.0" entry. Invalid days, such as April 31, are indicated by a "0.0" entry. On each page, the latitude and longitude of each station (in degrees, minutes and seconds) are noted immediately after the station designation.

It may be noted that, for ease in reference, the monthly- and annual-mean temperatures and salinities are summarized in Tables 2 and 3 respectively. Temperatures in Table 2 are given in °C (rounded to the first decimal place) rather than in °F, in deference to the almost-universal use of the Celsius system of temperature measurement in present-day marine science.

"Annual" graphs of the seven-day, normally-weighted running mean for temperature and salinity at each station comprise the second major section of the report (pp 80 to 111). These graphs are copies of the machine plots of the means - reduced for display by present-size pages. Any interruption in the associated computations will result in a gap in the plotted output. Each graph for temperature is provided with a scale in degrees C as well as one in degrees F.

From May 1974 onward, circumstances beyond the control of the program rendered it impossible to carry out observations at Departure Bay on weekends (Saturdays and Sundays) and on statutory holidays. The number of (non-interpolated) values available for determination of each monthly mean has therefore been reduced from, approximately, thirty to twenty at this station. The running-mean calculations have suffered accordingly.

In 1975, a series of equipment losses prevented water-*temperature* observations from being carried out at Bonilla Island during most of March as well as the first half of April. *Salinities*, however, were obtained throughout the period.

At Active Pass, the daily salinity values (and the associated running means) were relatively low during June through August - frequently <20°/₀₀. The salinity range utilized on page 111 has therefore been chosen to be 16 to 30°/₀₀, rather than 20 to 34°/₀₀ as in the other running-mean plots for salinity. It is felt that the behavior of the mean at this station during the three-month period can thus be better displayed.

Acknowledgements

This sampling program owes its success primarily to the efforts and dedication of the many observers who have taken, or are taking, part in the obtaining of the data. These observers have maintained a remarkable continuity of effort, often in the face of extremely hazardous weather and sea conditions. Excellent assistance has been received from the District Managers and the staffs of the Marine Transportation Division, Ministry of Transport (M.O.T.) in Victoria and Prince Rupert, as well as from the M.O.T. Radio Branch, which has transmitted the numerous messages involved in the program. The computations on the data were carried out by the Data Processing and Analysis Section of MEDS, under the supervision of Mr. J. Nasr.

References

Adams, K.T. 1942. Hydrographic manual. Rev. ed. U.S. Coast and Geodetic Survey. Special Publication No. 143.

Canadian Hydrographic Service. 1975. Canadian Tide and Current Tables, Volume 5. Juan de Fuca and Georgia Straits. Marine Sciences Directorate, Department of the Environment, Ottawa.

Holloway, J.L., Jr. 1958. Smoothing and filtering of time series and space fields. In: Advances in Geophysics, Vol. 4, pp. 351-389. Academic Press Inc., New York.

Somers, H. 1965. Program G20106, Daily Seawater Observations. Memorandum 1220-2-4/April 30, 1965. Canadian Oceanographic Data Centre, Special Administrative Services Division, Ottawa.

Zerbe, W.B., and C.B. Taylor. 1953. Sea water temperature and density reduction tables. U.S. Coast and Geodetic Survey. Special Publication No. 298.

Locations of B.C. shore stations making daily oceanographic observations in 1975.

Table 1. B.C. shore stations making oceanographic observations in 1975: general locations, and names of observers.

Station	Location	Observer(s)
Langara Island	Dixon Entrance, south side	S.G. Westhaver T.E. Carr L. Sabourin (Mrs.)
Bonilla Island	Hecate Strait, north	G.B. Agnew R.A. Nagel
McInnes Island	Milbanke Sound entrance, north side	F.M. Collette (Mrs.) R. Addison
Cape St. James	Queen Charlotte Islands, south end	D.L. Kupillas D.M. Short G. Anderson
Egg Island	Smith Sound, southern entrance	K.W. Millsip (Carson, (Miss, (Mrs.))
Pine Island	Queen Charlotte Strait, western entrance	V.C. Emrich (Mrs.) M.C. Tutt (Mrs.)
Kains Island	Quatsino Sound entrance, north side	L.C. Collins (Mrs.)
Amphitrite Point	Barkley Sound, western entrance	I.G. McNeil
Sheringham Point	Juan de Fuca Strait, northern shore	E.S. Bruton (Mrs.)
Race Rocks	Juan de Fuca Strait, eastern end	A.A. Anderson (Miss)
Cape Mudge	Strait of Georgia, northern entrance	R. Wilkie R. Lundy
Sisters Island	Strait of Georgia, central	D.J. McNeil W. Milne R.J. Grunert T.G. Smith
Chrome Island	Strait of Georgia, central western shore	W.E. Gardner
Departure Bay	Strait of Georgia, central western shore	D. Pozar
Entrance Island	Strait of Georgia, central western shore	E. Cehak (Mrs.)

Table 1 continued

Station	Location	Observer(s)
Active Pass	Strait of Georgia, southwestern shore	J.E. Ruck

Table 2. Monthly- and annual-mean temperatures (°C) - 1975.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	6.1	5.2	5.6	6.3	7.7	8.8	10.3	11.2	11.2	10.8	7.7	6.2	8.2
Bonilla I.	6.3	5.1	5.5*	6.7**	8.4	9.9	11.7	11.5	11.3	9.9	7.7	6.7	8.8
McInnes I.	6.4	5.6	6.1	6.9	9.1	10.4	12.5	12.5	11.8	10.4	8.2	6.9	8.9
Cape St. James	6.2	6.3	6.3	6.8	7.8	9.0	10.7	10.4	11.3	9.1	8.3	7.7	8.6
Egg I.	6.6	5.8	6.4	7.5	10.0	11.6	13.1	12.0	11.1	9.4	8.0	6.8	9.1
Pine I.	7.1	6.3	6.7	7.1	7.8	8.6	9.4	9.2	8.9	9.4	8.8	7.6	8.1
Kains I.	7.3	6.7	7.1	8.2	9.8	10.4	12.6	12.1	11.9	10.9	8.9	7.8	9.5
Amphitrite Pt.	7.6	6.7	7.6	8.8	10.4	10.8	12.0	12.6	13.2	11.6	9.9	8.4	10.0
Sheringham Pt.	7.4	6.9	7.2	7.8	8.6	9.8	10.6	10.7	10.3	9.8	9.4	7.8	8.9
Race Rocks	7.3	6.8	7.2	7.7	8.7	9.5	10.2	10.4	10.4	9.7	9.3	7.8	8.8
Cape Mudge	7.1	6.7	7.8	8.9	10.3	12.3	14.9	13.2	12.3	10.6	8.3	7.2	10.1
Sisters I.	6.6	6.1	6.9	8.6	10.9	14.3	18.2	16.2	14.8	10.9	8.5	6.6	10.7
Chrome I.	6.7	6.3	7.1	8.4	10.6	14.4	18.1	15.2	15.0	10.6	8.8	7.1	10.7
Departure Bay	6.6	6.2	6.8	8.0	10.8	13.7	17.1	15.0	14.8	10.4	8.3	6.9	10.9
Entrance I.	5.7	5.2	7.2	8.8	11.7	14.8	18.2	16.1	16.7	10.9	9.2	6.6	10.4
Active Pass	6.3	5.9	6.8	8.4	10.4	12.3	15.4	13.8	14.4	10.2	8.3	7.0	10.0

* Mean of 3 readings only (see page 4)
** Mean of 13 readings only (see page 4)

Table 3. Monthly- and annual-mean salinities (ppt, °/₀₀) - 1975.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	32.0	32.1	32.5	32.4	32.5	32.2	32.0	32.1	32.1	32.0	31.8	31.9	32.1
Bonilla I.	30.5	30.6	30.6	30.8	31.2	31.2	31.1	30.9	31.6	32.0	31.9	31.7	31.2
McInnes I.	30.3	31.0	31.2	31.3	31.1	30.6	30.4	28.9	30.4	30.8	30.1	30.2	30.5
Egg I.	31.6	31.9	31.5	31.4	30.4	28.8	29.2	30.2	31.0	31.6	30.5	30.4	30.7
Pine I.	31.0	31.1	31.1	31.3	31.6	31.5	31.5	31.5	31.6	31.6	30.7	30.5	31.2
Kains I.	29.4	30.5	29.8	31.0	31.7	32.2	32.5	31.9	32.3	30.9	27.7	29.2	30.8
Amphitrite Pt.	28.7	28.3	28.6	30.1	30.7	30.9	31.5	30.1	30.1	28.2	27.2	27.9	29.4
Race Rocks	31.8	31.6	31.6	32.0	32.1	32.2	31.8	31.7	31.7	32.1	31.4	30.9	31.7
Cape Mudge	28.8	29.0	29.2	29.5	29.5	28.9	26.8	27.7	28.4	28.6	27.0	27.5	28.4
Sisters I.	29.0	29.5	29.6	29.6	29.5	26.9	23.0	25.4	27.5	28.4	27.6	27.1	27.8
Chrome I.	29.4	29.6	29.9	30.2	30.2	28.9	25.8	27.6	28.2	29.7	28.2	27.7	28.8
Departure Bay	28.3	28.6	28.9	29.1	28.8	26.0	23.4	24.3	26.6	25.8	23.7	26.2	26.7
Entrance I.	28.6	28.9	28.9	29.3	28.3	26.2	23.1	25.2	25.8	27.7	26.4	26.1	27.0
Active Pass	28.5	28.7	28.7	29.3	27.7	24.9	23.1	26.1	23.7	28.7	27.2	26.6	26.9

Tabulations of Daily Sea-Surface

Temperature and Salinity

1975

TEMP: Temperature (°F)

SAL: Salinity (ppt, ‰)

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.5	32.1	41.8	32.1	42.5	32.4
2	44.9	32.0	41.4	32.1	42.2	32.7
3	43.9	32.5	* 41.1	* 32.2	42.3	32.4
4	* 44.0	* 32.2	40.8	32.4	* 42.4	* 32.6
5	44.2	31.9	41.2	32.5	42.5	32.9
6	44.0	31.8	41.6	32.1	* 42.3	* 32.7
7	43.0	31.8	41.6	32.3	42.0	32.4
8	42.4	31.5	41.3	32.4	42.0	32.8
9	40.6	31.8	40.9	32.1	42.5	32.7
10	41.4	32.1	40.1	31.8	41.7	32.8
11	41.0	32.4	38.2	32.0	41.7	32.4
12	43.1	32.0	40.2	32.0	40.0	32.4
13	42.2	31.8	40.6	32.4	41.7	31.6
14	42.5	32.0	41.6	31.9	42.5	32.7
15	42.2	32.4	41.1	32.1	42.5	32.7
16	43.0	31.6	41.1	32.1	42.5	32.5
17	43.5	32.1	41.9	32.0	43.0	32.5
18	43.6	31.8	42.3	31.9	43.0	32.5
19	43.5	31.9	* 41.9	* 31.9	42.7	32.4
20	* 43.5	* 32.0	41.4	31.9	42.5	32.5
21	43.6	32.1	41.6	31.9	43.0	32.8
22	43.2	31.8	42.8	32.0	41.7	32.8
23	43.3	31.5	* 42.6	* 32.1	39.0	32.7
24	42.0	32.0	* 42.3	* 32.3	40.5	32.3
25	42.6	32.0	42.0	32.5	41.5	32.5
26	43.2	31.9	42.5	32.1	40.7	32.9
27	43.4	32.0	43.0	32.4	41.2	32.9
28	43.7	32.5	43.0	32.5	43.0	32.7
29	43.5	32.4	0.0	0.0	42.0	32.0
30	42.8	32.1	0.0	0.0	42.5	32.1
31	42.3	32.3	0.0	0.0	43.0	32.7
MEANS	43.0	32.0	41.4	32.1	42.0	32.5
OBSVNS.	29	29	24	24	29	29
MAXIMUM	44.9	32.5	43.0	32.5	43.0	32.9
MINIMUM	40.6	31.5	38.2	31.8	39.0	31.6
STD.DEV.	.97	.27	1.04	.22	.96	.29

LANGARA ISLAND 54 15 19 N 133 03 30 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.3	32.1	43.5	32.4	47.8	32.1
2	42.5	32.1	44.5	32.4	47.0	32.1
3	42.6	32.1	44.5	32.4	47.2	32.7
4	41.5	32.0	44.0	32.5	47.2	32.0
5	43.0	32.4	44.3	32.1	48.0	31.9
6	41.6	32.1	44.0	32.3	47.2	32.0
7	43.2	32.3	44.3	32.5	49.0	32.1
8	43.0	32.4	46.2	32.9	48.2	32.0
9	43.2	32.3	45.3	32.8	48.5	32.0
10	43.5	32.5	46.0	32.9	48.3	32.3
11	43.3	32.1	45.5	32.7	48.0	32.3
12	44.0	32.4	* 46.1	* 32.7	47.5	31.9
13	44.0	32.5	46.8	32.6	47.9	32.1
14	44.3	32.8	46.5	32.9	47.6	32.0
15	43.5	32.5	47.5	* 32.7	48.5	32.1
16	43.8	32.5	* 47.3	* 32.4	49.2	32.0
17	43.2	32.4	47.0	32.1	48.0	32.0
18	42.4	32.4	46.6	32.1	47.5	32.1
19	42.0	32.1	46.2	32.5	46.7	32.3
20	43.0	32.3	45.7	32.4	47.0	31.9
21	42.5	32.5	45.7	32.5	47.5	32.3
22	43.8	32.4	46.5	32.9	47.5	32.1
23	43.5	32.5	45.2	32.3	47.2	32.3
24	44.4	32.5	45.5	31.9	47.0	32.1
25	44.7	32.5	46.5	32.3	48.0	32.3
26	43.5	32.7	46.2	32.4	49.2	32.4
27	43.6	32.3	45.7	32.1	48.5	32.7
28	45.0	31.9	46.5	32.5	49.5	32.3
29	44.0	32.7	47.0	32.9	48.3	32.0
30	44.5	32.4	49.0	32.3	50.0	32.3
31	0.0	0.0	49.0	32.3	0.0	0.0
MEANS	43.3	32.4	45.9	32.5	48.0	32.2
OBSVNS.	30	30	29	28	30	30
MAXIMUM	45.0	32.8	49.0	32.9	50.0	32.7
MINIMUM	41.5	31.9	43.5	31.9	46.7	31.9
STD.DEV.	.86	.22	1.34	.29	.82	.21

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.3	32.0	51.4	32.0	52.0	31.9
2	52.0	31.9	52.5	32.0	52.0	32.0
3	51.6	32.0	51.4	32.3	51.5	32.0
4	51.5	31.2	51.5	31.9	52.0	31.0
5	49.3	32.0	51.8	32.7	52.5	30.8
6	51.3	31.6	51.0	31.8	52.5	31.9
7	51.3	31.6	53.3	31.6	53.0	32.0
8	50.3	31.6	51.5	32.1	52.3	32.4
9	47.6	31.9	51.5	32.3	52.7	32.0
10	47.5	32.5	52.0	32.6	53.4	32.7
11	48.2	32.3	51.5	31.6	53.0	32.1
12	47.5	32.0	52.0	31.9	52.6	32.5
13	47.5	32.3	52.3	32.1	52.5	32.3
14	49.5	32.1	52.2	31.6	53.0	32.1
15	48.0	32.3	52.0	32.0	52.0	31.9
16	49.5	32.0	52.0	31.6	52.6	32.0
17	50.0	32.0	52.5	32.9	52.0	32.5
18	50.0	32.0	53.8	32.7	51.0	32.7
19	50.5	32.0	52.5	32.4	51.5	32.9
20	50.6	32.0	53.5	32.3	51.5	32.4
21	50.6	31.9	52.6	32.1	51.5	32.3
22	53.0	32.5	53.0	32.1	52.3	32.3
23	51.2	32.4	52.2	32.0	51.5	32.1
24	52.2	32.4	52.0	31.5	50.0	31.9
25	52.5	32.1	51.2	31.9	51.3	31.8
26	52.5	32.1	52.0	32.3	51.8	32.0
27	52.5	32.7	50.8	32.0	52.3	32.1
28	53.5	31.9	51.8	32.3	53.0	32.1
29	53.2	32.1	52.5	32.1	53.2	32.1
30	52.5	31.4	53.8	32.1	53.8	31.9
31	51.0	32.3	52.3	31.8	0.0	0.0
MEANS	50.6	32.0	52.1	32.1	52.2	32.1
OBSVNS.	31	31	31	31	30	30
MAXIMUM	53.5	32.7	53.8	32.9	53.8	32.9
MINIMUM	47.5	31.2	50.8	31.5	50.0	30.8
STD.DEV.	1.61	.33	.76	.36	.60	.42

LANGARA ISLAND 54 15 19 N 133 03 30 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	53.3	31.6	48.2	32.4	39.9	32.0
2	52.0	31.9	49.0	32.3	44.0	32.1
3	52.5	31.9	48.5	32.0	39.0	31.9
4	53.5	31.9	47.3	32.1	38.5	31.9
5	51.6	31.6	* 46.9	* 32.1	40.0	32.3
6	51.7	31.9	46.5	32.1	43.5	31.4
7	51.0	32.4	46.7	30.8	44.9	31.9
8	51.5	32.5	46.5	31.4	40.5	32.3
9	51.0	32.3	46.5	31.5	43.0	32.1
10	52.2	32.5	46.5	32.1	42.6	31.8
11	52.5	32.1	47.5	31.5	42.6	31.5
12	52.6	32.4	47.0	31.6	39.9	31.2
13	52.2	32.3	47.3	31.8	41.6	31.8
14	52.0	32.3	46.5	31.6	39.0	31.6
15	53.8	31.9	46.0	31.5	43.9	32.3
16	52.5	32.1	46.1	31.9	41.0	31.6
17	52.0	31.8	46.0	31.9	44.5	31.9
18	51.3	31.8	46.7	31.9	44.9	32.4
19	52.0	31.9	46.2	31.9	45.0	31.9
20	52.0	31.6	46.2	31.8	44.9	31.8
21	50.5	31.6	* 46.2	* 32.0	44.8	32.4
22	50.2	31.8	46.3	32.3	43.0	32.4
23	48.6	31.8	46.2	32.4	44.9	32.5
24	48.2	31.9	* 46.2	* 32.1	44.5	31.6
25	48.5	31.8	46.3	31.8	45.0	31.8
26	48.2	31.8	42.5	31.4	44.9	31.8
27	48.2	31.8	45.5	31.4	44.0	32.3
28	* 0.0	* 0.0	40.5	31.5	44.2	32.1
29	* 0.0	* 0.0	40.6	31.5	42.5	31.1
30	* 0.0	* 0.0	40.0	31.6	42.9	32.1
31	* 0.0	* 0.0	0.0	0.0	42.5	32.3
MEANS	51.4	32.0	45.9	31.8	42.6	31.9
OBSVNS.	27	27	27	27	31	31
YRLY.MEANS................................					46.7	32.1
MAXIMUM	53.8	32.5	49.0	32.4	45.0	32.5
MINIMUM	48.2	31.6	40.0	30.8	38.5	31.1
STD.DEV.	1.67	.26	2.29	.37	2.06	.36

BONILLA ISLAND 53 29 39 N 130 38 04 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.1	30.6	42.1	30.7	41.8	30.4
2	45.2	30.4	40.5	30.7	41.6	30.3
3	44.8	30.7	41.0	30.7	42.0	30.4
4	44.5	30.6	40.8	30.7	* 0.0	* 30.5
5	44.5	30.7	41.2	30.5	* 0.0	30.6
6	44.0	30.8	41.0	30.7	* 0.0	30.6
7	43.5	30.7	41.6	30.7	* 0.0	30.4
8	* 42.1	* 30.8	42.0	30.7	* 0.0	30.4
9	40.6	31.0	41.8	31.0	* 0.0	30.4
10	40.2	30.7	40.5	30.7	* 0.0	30.6
11	* 41.7	* 30.7	39.3	30.6	* 0.0	30.6
12	43.2	30.8	41.5	30.4	* 0.0	30.7
13	43.4	30.6	41.0	30.4	* 0.0	30.7
14	43.0	30.3	39.1	30.2	* 0.0	30.6
15	42.1	30.0	41.5	30.4	* 0.0	30.7
16	41.5	29.7	41.0	30.6	* 0.0	30.7
17	44.0	30.2	41.3	30.4	* 0.0	30.6
18	* 43.6	* 30.1	41.5	29.9	* 0.0	30.3
19	43.5	29.9	41.5	30.6	* 0.0	30.4
20	43.6	30.4	41.2	30.6	* 0.0	30.6
21	42.4	29.5	41.0	31.0	* 0.0	30.4
22	43.5	30.0	42.8	30.8	* 0.0	30.7
23	44.0	30.2	41.8	30.7	* 0.0	30.6
24	43.5	30.2	41.3	30.7	* 0.0	30.7
25	43.5	30.5	40.8	30.6	* 0.0	30.6
26	43.4	30.8	41.7	30.2	* 0.0	30.6
27	43.5	30.6	41.6	30.3	* 0.0	30.8
28	44.0	31.0	41.5	30.4	* 0.0	30.7
29	44.0	31.0	0.0	0.0	* 0.0	30.7
30	42.3	30.7	0.0	0.0	* 0.0	30.8
31	42.5	30.7	0.0	0.0	* 0.0	30.8
MEANS	43.3	30.5	41.2	30.6	41.9	30.6
OBSVNS.	28	28	28	28	3	30
MAXIMUM	45.2	31.0	42.8	31.0	42.0	30.8
MINIMUM	40.2	29.5	39.1	29.9	41.8	30.3
STD.DEV.	1.20	.40	.76	.24	.12	.15

BONILLA ISLAND 53 29 39 N 130 38 04 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 0.0	30.4	44.3	31.1	49.8	31.1
2	* 0.0	30.6	45.2	31.4	48.0	31.2
3	* 0.0	30.7	* 44.5	* 31.3	46.8	31.4
4	* 0.0	30.6	43.7	31.2	48.0	31.2
5	* 0.0	30.8	44.0	31.0	48.3	31.4
6	* 0.0	30.6	44.0	31.1	50.0	31.2
7	* 0.0	30.7	45.0	31.1	51.9	31.1
8	* 0.0	30.7	45.7	31.1	50.8	31.2
9	* 0.0	30.7	47.0	31.2	49.0	31.1
10	* 0.0	30.8	45.7	31.1	51.0	31.1
11	* 0.0	30.8	46.8	31.0	51.9	31.5
12	* 0.0	30.8	46.8	31.2	* 52.1	* 31.4
13	* 0.0	31.0	48.8	31.4	52.3	31.2
14	* 0.0	30.8	49.0	31.4	49.8	31.1
15	* 0.0	30.8	48.1	31.1	49.2	31.4
16	44.0	30.6	47.7	31.2	49.3	31.5
17	43.8	30.8	46.5	31.1	* 48.7	* 31.4
18	44.9	31.0	47.2	31.2	48.0	31.2
19	43.7	30.7	45.8	31.2	* 48.1	* 31.2
20	42.5	30.7	46.8	31.0	* 48.3	* 31.3
21	42.0	30.8	46.3	31.0	48.5	31.4
22	42.5	30.6	46.1	31.0	48.6	30.7
23	43.0	31.0	* 47.1	* 31.2	49.2	31.2
24	43.5	30.7	48.2	31.5	48.9	30.7
25	* 43.6	* 30.9	50.1	31.2	50.0	30.0
26	43.3	31.2	48.2	31.1	* 50.0	* 30.7
27	45.4	31.1	48.0	31.1	50.0	31.4
28	47.0	31.2	48.0	31.4	50.8	31.4
29	* 46.6	* 31.0	* 50.0	* 31.4	51.8	31.2
30	46.1	30.8	52.0	31.5	52.4	31.4
31	0.0	0.0	52.1	31.5	0.0	0.0
MEANS	44.0	30.8	47.1	31.2	49.8	31.2
OBSVNS.	15	28	26	28	25	25
MAXIMUM	47.0	31.2	52.1	31.5	52.4	31.5
MINIMUM	42.0	30.4	43.7	31.0	46.8	30.0
STD.DEV.	1.48	.18	2.15	.16	1.53	.32

BONILLA ISLAND 53 29 39 N 130 38 04 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.0	31.2	52.2	31.1	52.2	31.1
2	52.0	31.2	52.0	30.8	53.8	31.4
3	52.0	32.0	51.8	30.4	53.4	31.1
4	53.9	31.2	52.0	31.0	52.3	31.2
5	* 53.7	* 31.5	54.1	30.2	53.5	31.4
6	* 53.5	* 31.8	52.2	30.0	54.0	31.4
7	53.2	32.1	54.2	30.2	54.9	31.5
8	50.2	30.6	52.4	30.7	56.0	31.6
9	55.0	30.2	52.0	30.6	55.0	31.6
10	52.2	31.4	51.6	31.1	52.0	31.8
11	56.2	29.8	53.8	30.8	50.9	31.8
12	52.0	31.5	52.0	31.2	50.0	31.8
13	54.1	31.8	53.8	31.2	49.2	32.0
14	51.3	31.2	52.4	31.4	49.9	31.6
15	52.0	31.2	53.0	31.1	49.7	31.5
16	50.4	31.2	52.0	31.2	51.7	31.8
17	51.2	31.2	52.0	31.0	52.0	32.0
18	51.0	31.1	53.0	30.8	52.0	31.8
19	52.0	31.1	52.2	30.8	50.8	31.8
20	54.5	30.7	54.0	30.6	54.0	32.0
21	54.0	31.1	52.2	31.0	55.9	32.0
22	56.0	31.2	54.0	30.8	54.1	32.0
23	51.0	31.1	52.4	31.0	51.8	31.9
24	52.8	31.2	54.0	31.2	52.0	31.4
25	53.6	30.6	51.8	31.1	51.7	31.6
26	53.4	30.7	51.4	31.2	50.8	31.6
27	55.7	31.0	52.2	31.0	51.4	31.4
28	57.4	31.2	53.0	31.2	51.0	31.5
29	53.8	31.2	54.0	31.0	50.7	31.5
30	52.6	31.4	52.8	31.0	51.0	31.6
31	52.0	31.0	52.4	31.0	0.0	0.0
MEANS	53.1	31.1	52.7	30.9	52.3	31.6
OBSVNS.	29	29	31	31	30	30
MAXIMUM	57.4	32.1	54.2	31.4	56.0	32.0
MINIMUM	50.2	29.8	51.4	30.0	49.2	31.1
STD.DEV.	1.60	.47	.87	.33	1.82	.26

BONILLA ISLAND 53 29 39 N 130 38 04 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	51.6	31.9	47.0	32.1	44.3	31.9
2	51.9	31.8	48.0	31.9	43.3	31.6
3	51.0	31.5	48.0	31.9	43.2	31.6
4	52.0	31.9	47.1	32.0	44.0	31.6
5	50.4	31.4	46.8	32.0	43.7	31.5
6	50.8	31.5	* 46.5	* 32.0	* 44.6	* 31.5
7	52.0	31.9	46.2	31.9	45.5	31.6
8	52.2	32.1	46.4	32.0	44.0	31.9
9	50.0	31.8	46.3	32.3	43.6	31.8
10	* 50.0	* 31.9	45.8	32.3	43.0	31.5
11	50.0	32.0	* 46.4	* 32.3	42.9	31.5
12	50.0	32.3	47.0	32.3	43.0	31.5
13	49.7	32.4	46.2	32.1	43.0	31.5
14	49.7	32.4	* 46.2	* 32.1	43.0	31.5
15	50.0	32.1	* 46.1	* 32.2	42.7	31.6
16	50.0	32.0	46.0	32.3	42.0	31.6
17	50.1	32.3	46.0	32.1	* 43.5	* 31.6
18	49.0	31.8	44.2	32.0	45.0	31.6
19	50.0	32.1	46.1	31.9	45.0	31.9
20	51.8	32.1	45.8	32.0	45.1	31.8
21	51.2	32.3	44.7	31.8	45.1	31.8
22	49.4	32.1	45.8	32.0	45.0	31.8
23	49.9	32.1	46.0	31.5	45.0	31.6
24	47.2	32.0	46.0	31.6	45.2	31.8
25	48.7	32.1	45.8	31.0	44.8	31.4
26	48.4	32.3	45.4	31.5	45.6	31.6
27	48.0	32.0	* 44.7	* 31.7	45.0	31.9
28	47.4	32.3	44.0	32.0	44.8	31.6
29	46.2	32.1	42.0	31.8	45.0	31.6
30	47.0	32.4	42.0	31.5	44.6	31.9
31	46.0	32.0	0.0	0.0	43.2	31.8
MEANS	49.8	32.0	45.6	31.9	44.1	31.7
OBSVNS.	30	30	25	25	29	29
YRLY.MEANS..					47.8	31.2
MAXIMUM	52.2	32.4	48.0	32.3	45.8	31.9
MINIMUM	46.2	31.4	42.0	31.0	42.0	31.4
STD.DEV.	1.62	.26	1.48	.30	1.03	.15

MCINNES ISLAND 52 15 48 N 128 43 10 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.5	30.8	41.6	30.0	42.8	31.0
2	45.8	30.8	41.9	30.3	42.9	30.8
3	45.3	30.8	41.2	30.4	42.9	31.2
4	44.6	30.6	41.5	30.6	42.9	31.0
5	45.2	31.1	41.2	30.6	43.0	31.1
6	44.2	30.4	42.0	30.6	42.3	31.1
7	44.2	30.0	42.4	30.6	42.6	31.1
8	* 43.7	* 30.1	41.9	30.8	42.5	31.0
9	43.2	30.3	41.6	31.0	42.5	31.1
10	41.8	29.8	41.3	31.0	42.7	31.1
11	41.4	29.4	40.9	30.8	42.7	30.8
12	44.6	30.8	41.0	31.0	42.7	31.1
13	44.4	31.0	40.7	30.8	42.9	31.1
14	43.4	30.4	41.8	31.0	43.0	31.0
15	42.4	30.0	42.0	31.1	43.1	31.4
16	42.2	30.0	42.3	31.2	43.2	31.2
17	43.7	30.6	42.2	31.2	43.4	31.5
18	43.2	30.2	43.1	31.5	43.4	31.5
19	43.7	30.4	43.0	31.5	43.5	31.5
20	43.9	30.7	42.6	31.5	43.6	31.6
21	44.2	31.0	42.4	31.1	43.4	31.5
22	44.4	31.0	43.1	31.4	43.5	31.4
23	44.2	30.7	43.4	31.6	42.6	31.2
24	44.2	31.1	43.0	31.5	43.0	31.5
25	42.8	29.9	42.7	31.2	43.0	31.4
26	41.8	29.0	42.5	31.5	42.7	31.2
27	42.0	29.4	43.0	31.4	42.7	31.2
28	41.6	29.4	42.8	31.2	42.8	31.2
29	41.7	29.4	0.0	0.0	43.2	31.1
30	43.6	30.7	0.0	0.0	43.1	31.5
31	42.4	29.9	0.0	0.0	43.7	31.4
MEANS	43.5	30.3	42.1	31.0	43.0	31.2
OBSVNS.	30	30	28	28	31	31
MAXIMUM	45.8	31.1	43.4	31.6	43.7	31.6
MINIMUM	41.4	29.0	40.7	30.0	42.3	30.8
STD.DEV.	1.25	.59	.76	.42	.35	.22

MCINNES ISLAND 52 15 48 N 128 43 10 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.2	31.5	46.0	31.6	51.5	30.8
2	43.3	31.5	45.9	31.5	48.7	31.0
3	43.4	31.5	46.5	31.4	49.1	31.0
4	42.6	31.4	46.7	31.2	49.8	31.5
5	43.1	31.2	46.6	31.5	48.7	31.4
6	43.4	31.4	46.9	31.5	48.7	31.5
7	43.5	31.5	47.0	31.1	49.3	31.1
8	43.7	31.5	46.8	31.1	50.8	30.7
9	44.4	31.1	46.7	31.2	51.6	30.2
10	44.0	31.2	49.2	30.7	51.8	30.6
11	44.5	31.1	49.0	30.7	51.6	30.0
12	44.4	31.2	48.8	31.0	50.4	30.0
13	44.7	31.1	49.5	30.7	50.2	31.1
14	45.4	31.0	49.5	30.6	49.1	31.2
15	46.0	31.0	50.1	30.6	49.5	31.2
16	45.2	30.8	48.2	30.8	48.7	30.6
17	45.6	31.0	47.2	31.1	50.1	30.4
18	45.1	31.1	47.6	31.4	50.7	30.4
19	44.0	31.5	47.6	31.1	51.5	30.2
20	44.7	31.4	47.5	31.0	50.7	30.7
21	44.5	31.5	48.0	31.2	49.6	31.0
22	44.5	31.4	47.6	31.1	50.2	30.0
23	44.3	31.5	47.6	31.1	53.3	29.9
24	44.5	31.6	46.0	31.1	52.6	29.9
25	45.0	31.8	49.0	31.0	51.4	30.6
26	44.8	31.4	48.5	31.1	52.3	30.4
27	45.1	31.5	49.2	31.0	51.7	30.4
28	45.5	31.5	49.5	31.1	52.5	30.4
29	46.4	31.5	50.0	31.2	52.8	30.3
30	46.2	31.5	51.6	31.2	54.3	30.4
31	0.0	0.0	52.7	30.6	0.0	0.0
MEANS	44.5	31.3	48.3	31.1	50.8	30.6
OBSVNS.	30	30	31	31	30	30
MAXIMUM	46.4	31.8	52.7	31.6	54.3	31.5
MINIMUM	42.6	30.8	45.9	30.6	48.7	29.9
STD.DEV.	.96	.23	1.56	.28	1.52	.48

MCINNES ISLAND 52 15 48 N 128 43 10 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	54.3	30.2	54.9	29.3	54.5	28.4
2	51.0	30.4	54.2	29.7	54.6	29.5
3	52.4	30.6	54.7	29.4	54.8	28.9
4	53.6	30.3	55.3	30.3	54.9	28.4
5	52.2	30.4	54.5	30.0	55.8	29.0
6	52.1	30.4	54.0	30.8	54.6	29.7
7	54.9	30.3	54.7	30.0	55.3	29.4
8	53.7	30.3	54.9	28.9	53.5	30.2
9	54.9	30.2	54.5	30.0	52.7	30.0
10	54.0	30.0	54.6	27.6	51.2	30.6
11	53.4	30.4	56.7	25.9	53.4	29.8
12	54.0	30.6	57.0	27.4	51.5	30.8
13	54.8	30.6	56.6	26.2	49.5	30.8
14	55.1	31.0	55.0	29.0	51.3	30.3
15	53.4	31.0	54.7	28.8	51.4	30.2
16	53.2	31.0	55.1	29.1	51.2	30.8
17	53.0	31.0	55.5	29.4	51.7	30.6
18	53.8	31.4	54.9	26.5	51.9	30.8
19	55.3	31.5	54.3	28.8	52.2	30.7
20	54.8	31.2	53.7	29.5	52.0	31.1
21	55.9	30.4	53.3	29.4	53.1	30.6
22	57.6	28.5	54.7	28.8	53.3	30.6
23	56.4	29.5	54.3	28.9	53.8	30.7
24	56.1	30.0	53.7	29.1	55.1	31.4
25	55.8	30.6	52.5	29.5	54.9	31.4
26	54.6	31.1	53.7	27.8	54.7	31.4
27	55.0	30.3	55.0	26.1	54.2	31.4
28	57.4	29.3	52.5	29.5	53.8	31.4
29	56.0	30.4	53.5	29.5	53.6	31.5
30	56.1	29.5	53.4	29.1	53.6	31.5
31	55.0	29.0	54.4	28.5	0.0	0.0
MEANS	54.5	30.4	54.5	28.9	53.3	30.4
OBSVNS.	31	31	31	31	30	30
MAXIMUM	57.6	31.5	57.0	30.8	55.8	31.5
MINIMUM	51.0	28.5	52.5	25.9	49.5	28.4
STD.DEV.	1.54	.68	1.04	1.07	1.58	.91

MCINNES ISLAND 52 15 45 N 128 43 10 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.8	31.2	46.4	30.7	44.9	29.9
2	54.1	31.4	49.4	31.8	43.9	29.3
3	53.5	31.5	49.5	32.0	45.3	30.2
4	53.1	31.6	48.6	31.1	45.3	30.6
5	52.7	31.5	48.5	31.1	45.1	30.3
6	52.3	31.6	* 48.6	* 31.3	46.2	30.8
7	52.8	31.2	48.7	31.5	46.6	31.2
8	52.2	31.5	48.0	31.1	46.6	31.5
9	52.3	30.7	46.9	30.2	45.2	30.6
10	52.7	30.6	46.8	29.8	44.9	30.4
11	52.5	30.3	47.6	31.9	42.6	29.1
12	52.0	30.4	46.6	31.8	44.3	29.9
13	51.8	30.8	48.4	31.6	42.6	28.9
14	50.4	31.6	47.4	30.4	43.2	29.7
15	50.2	31.9	* 47.1	* 30.2	42.8	29.5
16	50.0	32.0	46.8	29.3	43.1	29.3
17	50.5	31.2	46.5	29.5	43.0	29.5
18	50.1	31.6	45.0	27.4	44.5	29.8
19	49.8	32.0	45.3	28.6	43.5	28.8
20	49.7	31.8	45.2	28.5	43.0	29.8
21	50.0	31.5	45.6	28.9	43.5	29.8
22	49.2	27.7	47.3	29.8	45.5	30.4
23	48.6	28.9	46.9	30.4	43.9	29.8
24	48.6	28.9	46.3	29.7	44.5	30.7
25	49.3	30.3	46.7	30.0	44.3	31.0
26	48.9	29.8	47.0	30.8	44.0	30.2
27	47.9	29.8	44.9	29.3	43.5	31.2
28	48.0	30.0	44.2	28.6	45.3	31.2
29	47.6	29.3	42.5	27.4	45.6	31.0
30	47.3	29.9	44.3	29.5	44.3	30.4
31	49.7	32.0	0.0	0.0	44.0	30.2
MEANS	50.7	30.8	46.8	30.1	44.4	30.2
OBSVNS.	31	31	26	28	31	31
YRLY. MEANS..					48.1	30.5
MAXIMUM	54.1	32.0	49.5	32.0	46.6	31.5
MINIMUM	47.3	27.7	42.5	27.4	42.6	28.8
STD.DEV.	1.97	1.09	1.72	1.29	1.14	.72

CAPE ST JAMES 51 56 18 N 131 0 50 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1975
1	46.1	* 0.0	* 0.0	* 0.0	42.9	* 0.0
2	46.2	* 0.0	43.5	* 0.0	43.3	* 0.0
3	45.6	* 0.0	* 43.4	* 0.0	43.1	* 0.0
4	45.2	* 0.0	43.3	* 0.0	43.4	* 0.0
5	45.4	* 0.0	* 43.4	* 0.0	44.4	* 0.0
6	44.9	* 0.0	43.6	* 0.0	43.4	* 0.0
7	45.5	* 0.0	43.3	* 0.0	43.1	* 0.0
8	44.4	* 0.0	43.4	* 0.0	* 43.2	* 0.0
9	45.2	* 0.0	44.3	* 0.0	43.4	* 0.0
10	44.5	* 0.0	42.9	* 0.0	43.1	* 0.0
11	* 44.9	* 0.0	42.5	* 0.0	42.9	* 0.0
12	45.3	* 0.0	42.7	* 0.0	43.3	* 0.0
13	44.9	* 0.0	43.0	* 0.0	43.2	* 0.0
14	44.9	* 0.0	43.2	* 0.0	43.4	* 0.0
15	44.9	* 0.0	* 43.2	* 0.0	42.9	* 0.0
16	45.3	* 0.0	43.3	* 0.0	* 43.2	* 0.0
17	45.5	* 0.0	43.6	* 0.0	43.5	* 0.0
18	45.2	* 0.0	43.6	* 0.0	43.5	* 0.0
19	45.3	* 0.0	43.1	* 0.0	43.6	* 0.0
20	45.5	* 0.0	43.1	* 0.0	43.8	* 0.0
21	* 45.6	* 0.0	43.4	* 0.0	43.5	* 0.0
22	45.7	* 0.0	43.9	* 0.0	43.6	* 0.0
23	45.3	* 0.0	43.8	* 0.0	42.9	* 0.0
24	44.7	* 0.0	43.6	* 0.0	43.5	* 0.0
25	44.9	* 0.0	43.5	* 0.0	43.7	* 0.0
26	44.7	* 0.0	* 43.7	* 0.0	42.9	* 0.0
27	44.8	* 0.0	43.9	* 0.0	43.0	* 0.0
28	44.8	* 0.0	43.0	* 0.0	* 0.0	* 0.0
29	* 0.0	* 0.0	0.0	0.0	* 0.0	* 0.0
30	* 0.0	* 0.0	0.0	0.0	* 0.0	* 0.0
31	* 0.0	* 0.0	0.0	0.0	* 0.0	* 0.0
MEANS	45.2	0.0	43.4	0.0	43.3	0.0
OBSVNS.	26	0	23	0	25	0
MAXIMUM	46.2	0.0	44.3	0.0	44.4	0.0
MINIMUM	44.4	0.0	42.5	0.0	42.9	0.0
STD.DEV.	.45	0.00	.41	0.00	.35	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.5	* 0.0	45.0	* 0.0	47.7	* 0.0
2	43.8	* 0.0	45.2	* 0.0	47.0	* 0.0
3	43.7	* 0.0	45.1	* 0.0	47.3	* 0.0
4	44.2	* 0.0	44.8	* 0.0	47.5	* 0.0
5	43.1	* 0.0	45.3	* 0.0	47.5	* 0.0
6	43.6	* 0.0	45.3	* 0.0	47.6	* 0.0
7	43.8	* 0.0	45.9	* 0.0	47.7	* 0.0
8	43.5	* 0.0	45.3	* 0.0	48.4	* 0.0
9	44.7	* 0.0	46.1	* 0.0	48.1	* 0.0
10	* 0.0	* 0.0	45.6	* 0.0	47.5	* 0.0
11	* 0.0	* 0.0	45.8	* 0.0	47.0	* 0.0
12	* 0.0	* 0.0	46.6	* 0.0	47.3	* 0.0
13	43.5	* 0.0	46.5	* 0.0	47.6	* 0.0
14	44.8	* 0.0	46.0	* 0.0	47.3	* 0.0
15	44.9	* 0.0	46.5	* 0.0	47.2	* 0.0
16	44.8	* 0.0	46.1	* 0.0	47.4	* 0.0
17	44.6	* 0.0	45.5	* 0.0	48.0	* 0.0
18	44.0	* 0.0	45.3	* 0.0	48.9	* 0.0
19	43.7	* 0.0	45.8	* 0.0	50.1	* 0.0
20	44.2	* 0.0	46.1	* 0.0	49.2	* 0.0
21	43.8	* 0.0	46.3	* 0.0	48.6	* 0.0
22	43.9	* 0.0	46.6	* 0.0	49.0	* 0.0
23	44.1	* 0.0	46.1	* 0.0	48.8	* 0.0
24	44.5	* 0.0	46.4	* 0.0	48.5	* 0.0
25	44.7	* 0.0	46.8	* 0.0	48.2	* 0.0
26	43.9	* 0.0	46.3	* 0.0	48.6	* 0.0
27	44.3	* 0.0	46.5	* 0.0	49.0	* 0.0
28	44.6	* 0.0	46.1	* 0.0	49.2	* 0.0
29	45.2	* 0.0	48.0	* 0.0	50.1	* 0.0
30	45.0	* 0.0	47.8	* 0.0	49.3	* 0.0
31	0.0	0.0	47.7	* 0.0	0.0	0.0
MEANS	44.2	0.0	46.1	0.0	48.2	0.0
OBSVNS.	27	0	31	0	30	0
MAXIMUM	45.2	0.0	48.0	0.0	50.1	0.0
MINIMUM	43.1	0.0	44.8	0.0	47.0	0.0
STD.DEV.	.55	0.00	.79	0.00	.89	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

JULY AUGUST SEPTEMBER 1975

DATE	JULY TEMP		JULY SAL	AUGUST TEMP		AUGUST SAL	SEPTEMBER TEMP		SEPTEMBER SAL
1	49.4	*	0.0	50.7	*	0.0	50.8	*	0.0
2	51.3	*	0.0	50.0	*	0.0	52.2	*	0.0
3	49.8	*	0.0	50.2	*	0.0	53.4	*	0.0
4	51.3	*	0.0	50.1	*	0.0	53.1	*	0.0
5	52.0	*	0.0	48.7	*	0.0	52.6	*	0.0
6	52.4	*	0.0	49.0	*	0.0	51.6	*	0.0
7	52.2	*	0.0	49.2	*	0.0	51.1	*	0.0
8	51.6	*	0.0	48.8	*	0.0	51.4	*	0.0
9	51.9	*	0.0	48.6	*	0.0	52.5	*	0.0
10	52.2	*	0.0	49.4	*	0.0	52.9	*	0.0
11	51.7	*	0.0	50.5	*	0.0	52.6	*	0.0
12	51.6	*	0.0	50.9	*	0.0	52.5	*	0.0
13	50.9	*	0.0	51.4	*	0.0	52.2	*	0.0
14	51.3	*	0.0	50.0	*	0.0	52.0	*	0.0
15	52.2	*	0.0	50.6	*	0.0	52.5	*	0.0
16	51.0	*	0.0	50.2	*	0.0	52.3	*	0.0
17	51.4	*	0.0	50.5	*	0.0	52.6	*	0.0
18	51.3	*	0.0	50.9	*	0.0	53.5	*	0.0
19	51.6	*	0.0	50.6	*	0.0	53.6	*	0.0
20	52.7	*	0.0	50.8	*	0.0	54.0	*	0.0
21	51.7	*	0.0	50.5	*	0.0	53.6	*	0.0
22	52.1	*	0.0	51.1	*	0.0	53.3	*	0.0
23	51.6	*	0.0	51.6	*	0.0	53.0	*	0.0
24	50.8	*	0.0	51.5	*	0.0	52.5	*	0.0
25	50.5	*	0.0	52.4	*	0.0	51.8	*	0.0
26	50.7	*	0.0	53.1	*	0.0	51.4	*	0.0
27	50.1	*	0.0	53.4	*	0.0	51.6	*	0.0
28	49.6	*	0.0	53.5	*	0.0	51.7	*	0.0
29	49.0	*	0.0	53.1	*	0.0	51.8	*	0.0
30	50.2	*	0.0	52.2	*	0.0	51.9	*	0.0
31	51.1	*	0.0	50.7	*	0.0	0.0		0.0
MEANS	51.2		0.0	50.8		0.0	52.4		0.0
OBSVNS.	31		0	31		0	30		0
MAXIMUM	52.7		0.0	53.5		0.0	54.0		0.0
MINIMUM	49.0		0.0	48.6		0.0	50.8		0.0
STD.DEV.	.93		0.00	1.35		0.00	.82		0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

DATE	OCTOBER TEMP		OCTOBER SAL	NOVEMBER TEMP		NOVEMBER SAL	DECEMBER 1975 TEMP		DECEMBER 1975 SAL
1	52.9	*	0.0	46.8	*	0.0	47.2	*	0.0
2	51.7	*	0.0	46.9	*	0.0	46.9	*	0.0
3	49.5	*	0.0	47.1	*	0.0	46.3	*	0.0
4	47.4	*	0.0	47.2	*	0.0	46.0	*	0.0
5	47.8	*	0.0	46.8	*	0.0	46.2	*	0.0
6	47.6	*	0.0	47.2	*	0.0	45.6	*	0.0
7	47.9	*	0.0	45.9	*	0.0	46.5	*	0.0
8	48.2	*	0.0	46.0	*	0.0	46.2	*	0.0
9	48.4	*	0.0	46.8	*	0.0	45.5	*	0.0
10	49.1	*	0.0	46.7	*	0.0	45.5	*	0.0
11	48.4	*	0.0	46.9	*	0.0	45.4	*	0.0
12	48.9	*	0.0	46.5	*	0.0	45.9	*	0.0
13	48.9	*	0.0	47.0	*	0.0	45.8	*	0.0
14	47.6	*	0.0	46.6	*	0.0	45.7	*	0.0
15	49.2	*	0.0	46.8	*	0.0	46.2	*	0.0
16	47.5	*	0.0	46.8	*	0.0	46.0	*	0.0
17	47.8	*	0.0	47.1	*	0.0	46.3	*	0.0
18	47.3	*	0.0	47.0	*	0.0	46.3	*	0.0
19	47.2	*	0.0	47.1	*	0.0	46.2	*	0.0
20	48.3	*	0.0	47.2	*	0.0	45.9	*	0.0
21	47.9	*	0.0	47.4	*	0.0	45.8	*	0.0
22	47.8	*	0.0	47.3	*	0.0	45.7	*	0.0
23	48.1	*	0.0	47.2	*	0.0	45.7	*	0.0
24	47.6	*	0.0	47.5	*	0.0	45.7	*	0.0
25	47.1	*	0.0	47.5	*	0.0	45.7	*	0.0
26	47.8	*	0.0	46.9	*	0.0	45.4	*	0.0
27	48.0	*	0.0	46.9	*	0.0	45.4	*	0.0
28	47.8	*	0.0	46.8	*	0.0	45.4	*	0.0
29	47.8	*	0.0	46.6	*	0.0	45.4	*	0.0
30	47.1	*	0.0	47.4	*	0.0	45.4	*	0.0
31	47.2	*	0.0	0.0		0.0	45.4	*	0.0
MEANS	48.3		0.0	47.0		0.0	45.9		0.0
OBSVNS.	31		0	30		0	31		0
YRLY. MEANS..							47.4		0.0
MAXIMUM	52.9		0.0	48.8		0.0	47.2		0.0
MINIMUM	47.1		0.0	45.9		0.0	45.4		0.0
STD.DEV.	1.26		0.00	.51		0.00	.46		0.00

EGG ISLAND 51 15 06 N 127 49 53 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.0	31.8	42.3	31.8	44.2	31.6
2	* 44.0	* 31.6	42.2	31.8	43.9	31.9
3	44.6	31.9	41.5	31.6	43.5	32.1
4	43.8	31.9	42.4	31.8	42.9	31.8
5	43.6	31.9	41.5	31.8	42.9	31.8
6	43.0	31.8	41.5	32.0	41.9	31.8
7	42.4	31.9	42.9	31.8	42.8	31.9
8	* 42.3	* 31.8	41.5	32.0	42.9	31.2
9	* 42.2	* 31.6	41.5	31.8	43.5	31.4
10	42.0	31.4	41.3	31.8	43.4	31.4
11	41.9	31.5	42.8	32.0	43.8	31.1
12	47.2	31.6	41.8	32.0	43.2	31.0
13	47.0	31.9	40.9	31.9	43.5	31.9
14	45.4	31.9	42.5	32.0	44.2	31.6
15	44.6	31.5	43.1	32.1	44.9	31.8
16	46.9	31.6	42.9	32.0	* 44.7	* 31.8
17	44.5	31.6	42.9	31.8	* 44.5	* 31.7
18	43.8	31.6	42.7	31.8	44.3	31.6
19	44.5	31.6	42.2	31.8	43.6	31.6
20	43.9	31.6	41.7	31.8	42.8	31.5
21	43.9	31.5	41.8	31.8	43.9	31.6
22	43.0	31.6	42.9	32.0	43.5	31.5
23	44.2	31.4	43.4	31.8	43.4	31.2
24	* 43.8	* 31.4	42.5	32.0	43.2	31.5
25	43.3	31.5	42.9	32.0	43.6	31.6
26	42.8	31.2	43.6	32.1	43.8	31.6
27	42.9	31.2	43.5	32.1	44.0	31.4
28	43.9	31.2	43.6	31.8	44.6	31.6
29	43.3	31.5	0.0	0.0	45.0	31.6
30	42.9	31.2	0.0	0.0	43.1	31.2
31	42.9	31.5	0.0	0.0	43.5	31.1
MEANS	44.0	31.6	42.4	31.9	43.6	31.5
OBSVNS.	27	27	28	28	29	29
MAXIMUM	47.2	31.9	43.6	32.1	45.0	32.1
MINIMUM	41.9	31.2	40.9	31.6	41.9	31.0
STD.DEV.	1.40	.23	.77	.13	.67	.27

EGG ISLAND 51 15 06 N 127 49 53 W

DATE	APRIL TEMP	APRIL SAL	MAY TEMP	MAY SAL	JUNE TEMP	JUNE SAL 1975
1	43.4	31.6	47.7	30.6	54.8	29.1
2	43.5	31.6	45.0	31.1	52.5	28.5
3	43.4	31.6	47.1	30.8	48.3	30.7
4	43.7	31.4	48.3	30.6	49.4	30.8
5	43.4	31.6	50.0	30.6	51.0	29.7
6	45.5	31.4	46.9	30.7	50.7	30.0
7	45.4	31.4	49.4	31.0	51.7	30.4
8	44.6	31.4	51.9	30.7	52.8	29.4
9	45.4	31.4	50.9	31.2	51.6	29.4
10	45.4	31.4	50.7	30.3	51.8	29.9
11	45.5	31.4	50.5	30.8	52.4	29.9
12	46.0	31.5	51.4	30.7	49.2	30.2
13	46.2	31.2	51.6	30.4	51.5	29.4
14	46.4	31.2	51.9	30.4	51.4	30.2
15	46.5	31.2	50.1	30.0	51.0	30.4
16	47.2	31.2	* 49.9	* 30.4	51.4	29.7
17	47.8	30.6	49.6	30.8	54.5	28.5
18	45.0	31.1	48.4	31.0	54.4	28.5
19	45.4	31.5	48.3	31.0	53.5	27.3
20	45.3	31.2	47.2	30.8	53.4	27.8
21	45.1	31.1	47.8	30.8	53.7	28.1
22	45.0	31.4	47.9	30.0	53.5	27.6
23	45.2	31.4	47.9	30.3	53.5	27.6
24	45.5	31.6	48.7	30.4	53.4	27.3
25	45.6	31.8	50.4	30.6	54.6	27.7
26	45.5	31.8	51.5	28.9	55.0	28.0
27	46.1	31.8	52.4	28.9	55.5	23.7
28	46.6	31.5	56.2	29.1	52.9	30.7
29	47.6	31.1	50.4	30.0	56.6	27.6
30	48.0	30.8	53.0	29.4	56.9	27.3
31	0.0	0.0	55.9	30.2	0.0	0.0
MEANS	45.5	31.4	50.0	30.4	52.6	28.8
OBSVNS.	30	30	30	30	30	30
MAXIMUM	48.6	31.8	56.2	31.2	56.9	30.8
MINIMUM	43.4	30.8	45.0	28.9	48.3	23.7
STD.DEV.	1.34	.26	2.52	.62	2.05	1.53

EGG ISLAND 51 15 06 N 127 49 53 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.5	27.1	54.2	31.2	51.2	30.7
2	55.9	28.9	53.9	30.7	49.7	31.1
3	56.6	29.8	51.5	31.5	51.3	30.7
4	51.5	26.5	53.9	31.6	51.4	32.0
5	50.4	30.6	51.5	31.2	51.4	31.2
6	52.5	29.7	* 51.7	* 31.0	50.7	31.1
7	55.9	29.8	52.0	30.8	51.2	30.7
8	55.2	30.6	50.9	31.0	50.5	31.4
9	57.0	27.3	50.8	30.8	51.6	31.6
10	56.2	29.4	51.9	31.2	51.6	31.2
11	* 57.1	* 29.6	54.2	30.2	54.3	31.0
12	56.0	29.8	55.2	31.2	54.5	31.0
13	59.5	26.7	55.0	27.6	53.1	31.0
14	57.8	26.4	56.4	28.4	52.5	30.2
15	57.7	26.4	57.0	26.7	50.8	30.6
16	57.6	25.6	55.9	29.4	49.8	31.1
17	54.4	29.4	56.0	28.8	51.6	31.5
18	53.6	27.3	54.0	31.0	50.9	31.2
19	53.3	30.8	53.6	30.4	52.0	31.4
20	55.6	29.4	55.2	29.5	52.7	31.0
21	55.5	29.1	* 54.7	* 29.3	53.0	31.2
22	55.4	27.1	54.2	29.0	53.6	30.7
23	60.0	27.2	53.6	29.9	53.1	31.0
24	58.2	32.5	55.8	29.5	52.0	31.2
25	55.9	31.1	52.5	31.8	51.1	31.2
26	55.3	30.8	53.5	29.1	51.8	31.5
27	54.3	32.3	53.3	30.7	51.2	31.0
28	* 53.4	* 32.3	52.4	30.3	52.2	30.4
29	52.5	32.3	51.0	30.6	53.4	30.7
30	54.4	32.3	54.4	30.4	52.2	30.6
31	54.8	27.7	51.7	32.0	0.0	0.0
MEANS	55.5	29.2	53.6	30.2	51.9	31.0
OBSVNS.	29	29	29	29	30	30
MAXIMUM	60.0	32.5	57.0	32.0	54.5	32.0
MINIMUM	50.4	25.6	50.8	26.7	49.7	30.2
STD.DEV.	2.26	1.98	1.76	1.27	1.19	.38

EGG ISLAND 51 15 06 N 127 49 53 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.2	30.7	47.4	31.5	44.4	29.5
2	52.4	30.0	47.6	31.6	45.0	29.3
3	52.2	30.4	48.7	31.6	45.1	30.0
4	48.3	31.6	47.7	31.1	* 45.5	* 30.9
5	48.9	32.0	47.3	28.5	45.9	31.8
6	49.8	31.1	* 48.0	* 30.0	44.5	29.3
7	50.1	31.1	48.8	31.5	45.6	31.0
8	48.5	31.9	47.6	31.6	45.5	30.7
9	49.8	31.9	47.7	31.4	43.8	30.6
10	48.5	32.0	48.8	31.4	42.9	30.4
11	48.0	32.0	47.5	31.6	41.4	30.4
12	49.0	31.9	46.9	31.0	41.8	30.4
13	48.5	32.3	* 46.6	* 30.0	42.9	30.2
14	48.9	32.0	46.7	29.9	42.5	30.4
15	49.0	32.0	47.1	30.4	44.0	30.8
16	48.9	32.3	45.8	30.0	42.7	30.4
17	48.9	32.0	45.5	30.0	43.8	30.6
18	49.0	32.3	44.8	28.5	44.5	30.3
19	48.7	32.0	45.4	29.8	43.5	29.5
20	48.5	31.9	45.7	30.2	44.4	30.0
21	48.0	31.6	45.6	30.2	44.3	29.5
22	47.9	31.6	46.7	30.4	44.6	30.3
23	48.1	31.1	46.5	30.7	45.0	30.3
24	48.0	30.6	45.5	31.8	45.2	30.3
25	48.2	30.6	45.4	30.2	45.0	30.6
26	47.9	31.6	45.2	30.2	45.5	31.0
27	48.0	31.9	* 45.0	* 30.2	45.3	30.8
28	47.4	31.8	44.6	30.3	45.4	31.0
29	46.7	31.5	43.5	29.8	45.8	31.0
30	47.4	31.6	42.7	29.4	* 45.0	* 31.0
31	47.7	31.6	0.0	0.0	44.1	31.1
MEANS	48.9	31.6	46.4	30.5	44.3	30.4
OBSVNS.	31	31	27	27	29	29
YRLY.MEANS..					48.3	30.7
MAXIMUM	54.2	32.3	48.8	31.8	45.9	31.8
MINIMUM	46.7	30.0	42.7	28.5	41.4	29.3
STD.DEV.	1.55	.60	1.53	.92	1.20	.59

PINE ISLAND 50 58 33 N 127 43 35 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.2	31.1	43.8	31.2	44.0	31.2
2	45.5	31.1	43.5	31.1	43.8	31.1
3	45.7	31.1	43.2	31.0	44.0	31.1
4	45.5	31.2	43.2	31.1	44.0	31.1
5	45.1	31.0	43.3	31.1	44.1	31.1
6	45.0	30.8	43.4	31.2	44.2	31.4
7	44.8	31.1	43.5	31.1	43.8	31.2
8	45.4	31.2	43.2	31.1	43.8	31.1
9	44.6	31.0	43.2	31.2	44.0	31.4
10	44.5	30.8	43.2	31.1	43.8	31.0
11	44.0	30.8	43.7	31.2	44.0	31.1
12	44.3	30.8	43.2	31.2	43.8	31.4
13	44.6	30.8	43.4	31.2	43.8	31.4
14	44.6	31.0	43.3	31.1	43.8	31.4
15	44.3	31.1	43.5	31.2	44.0	31.1
16	44.5	31.0	43.7	31.1	43.8	31.1
17	44.6	31.0	43.4	31.2	44.0	31.2
18	44.5	31.1	43.5	31.4	44.1	31.1
19	44.7	31.4	43.2	31.1	44.3	31.1
20	44.0	31.2	43.2	31.2	44.0	31.0
21	44.7	31.1	43.3	31.1	44.3	31.0
22	44.6	31.0	43.2	31.2	44.0	30.8
23	44.5	30.7	43.2	30.7	44.0	31.1
24	44.5	30.8	43.3	30.8	44.2	30.8
25	44.5	31.0	43.2	31.0	44.0	31.0
26	44.5	30.8	43.3	31.2	44.2	30.8
27	44.5	31.1	43.7	31.2	44.0	31.4
28	44.4	31.0	44.0	31.2	44.2	31.1
29	44.4	31.0	0.0	0.0	44.3	31.1
30	43.8	31.2	0.0	0.0	44.2	31.1
31	44.0	31.0	0.0	0.0	44.5	31.2
MEANS	44.7	31.0	43.4	31.1	44.0	31.1
OBSVNS.	31	31	28	28	31	31
MAXIMUM	45.7	31.4	44.0	31.4	44.5	31.4
MINIMUM	43.8	30.7	43.2	30.7	43.8	30.8
STD.DEV.	.44	.16	.22	.13	.19	.17

PINE ISLAND 50 58 33 N . 127 43 35 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.8	31.1	46.0	31.4	47.0	31.5
2	43.8	31.2	45.2	31.4	47.2	31.6
3	43.8	31.1	45.4	31.4	48.0	31.0
4	44.1	31.1	45.0	31.2	47.8	31.2
5	43.8	30.8	45.0	31.4	47.0	31.4
6	44.0	31.0	45.0	31.4	47.0	31.4
7	44.0	30.8	45.2	31.6	47.2	31.8
8	43.8	31.0	45.0	31.4	48.0	31.8
9	44.0	31.0	46.5	31.4	47.8	31.6
10	44.8	31.2	46.0	31.2	47.2	31.8
11	44.5	31.4	46.7	31.4	47.0	31.6
12	44.6	31.2	46.0	31.5	47.0	31.8
13	44.9	31.4	46.1	31.4	47.3	31.6
14	45.3	31.2	46.0	31.8	47.0	31.4
15	45.8	31.4	46.5	31.8	46.8	31.5
16	45.2	31.4	46.2	31.6	46.9	31.4
17	45.0	31.1	46.0	31.8	47.0	31.5
18	44.7	31.4	46.2	31.6	47.0	31.4
19	44.7	31.4	46.0	31.5	48.0	31.4
20	44.8	31.1	46.2	31.4	47.5	31.6
21	44.8	31.0	46.5	31.4	48.0	31.5
22	44.5	31.4	46.2	31.6	47.5	31.2
23	44.6	31.1	46.5	31.6	47.8	31.8
24	44.5	31.4	46.0	31.9	47.9	31.4
25	44.8	31.6	46.5	31.9	47.0	31.6
26	45.0	31.8	46.8	31.8	47.5	31.4
27	45.0	31.6	46.4	31.6	48.0	31.5
28	45.4	31.6	46.5	31.9	47.5	31.9
29	45.6	31.6	46.8	31.6	48.0	31.6
30	45.7	31.5	47.2	31.6	47.5	31.6
31	0.0	0.0	48.2	31.5	0.0	0.0
MEANS	44.6	31.3	46.1	31.6	47.4	31.5
OBSVNS.	30	30	31	31	30	30
MAXIMUM	45.8	31.8	48.2	31.9	48.0	31.9
MINIMUM	43.8	30.8	45.0	31.2	46.8	31.0
STD.DEV.	.60	.25	.71	.20	.42	.20

PINE ISLAND 50 58 33 N 127 43 35 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	49.0	31.8	50.0	31.4	48.5	31.5
2	48.5	31.2	49.5	31.5	49.0	31.2
3	49.0	31.0	49.5	31.2	48.8	31.1
4	48.5	31.2	49.5	31.2	49.0	31.0
5	48.0	31.6	49.0	31.5	48.8	31.5
6	48.5	31.5	49.5	31.4	48.5	31.4
7	48.0	31.6	49.0	31.5	47.9	31.5
8	48.0	31.8	48.0	31.6	47.5	31.9
9	49.0	31.5	48.0	31.5	47.6	31.8
10	49.0	31.5	48.0	31.4	47.8	31.8
11	49.0	31.1	48.5	31.5	48.5	31.8
12	50.5	31.8	48.0	31.6	47.6	31.8
13	49.0	31.6	48.5	31.4	47.9	31.6
14	48.0	31.6	48.5	31.8	47.9	31.6
15	49.0	31.5	48.5	31.6	47.7	31.6
16	49.0	31.6	48.0	31.6	47.7	31.5
17	48.5	31.4	48.5	31.8	47.9	31.5
18	49.0	31.2	48.0	31.4	47.5	31.6
19	49.0	31.5	48.0	31.5	47.8	31.6
20	49.0	31.8	48.0	31.4	48.4	31.6
21	49.0	31.5	48.5	31.5	48.8	31.6
22	49.5	31.5	48.5	31.6	48.2	31.8
23	49.0	31.2	48.5	31.8	48.0	31.6
24	49.0	31.0	48.5	31.5	47.6	31.6
25	49.5	31.4	48.5	31.5	47.5	31.6
26	49.5	31.5	48.5	31.8	48.0	31.8
27	49.0	31.8	48.5	31.9	47.6	31.8
28	49.0	31.6	48.0	31.5	48.1	31.6
29	49.0	31.8	48.0	31.4	48.5	31.5
30	49.0	31.6	47.8	31.5	47.8	31.5
31	49.5	31.6	48.5	31.5	0.0	0.0
MEANS	48.9	31.5	48.5	31.5	48.1	31.6
OBSVNS.	31	31	31	31	30	30
MAXIMUM	50.5	31.8	50.0	31.9	49.0	31.9
MINIMUM	48.0	31.0	47.8	31.2	47.5	31.0
STD.DEV.	.52	.24	.57	.16	.47	.21

PINE ISLAND 50 58 33 N 127 43 35 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	48.2	31.4	49.3	31.1	45.8	29.9
2	48.0	31.5	49.3	31.1	45.8	30.2
3	47.5	31.8	49.7	31.0	45.9	30.2
4	48.1	31.8	49.5	31.0	46.0	30.4
5	48.6	31.6	48.5	31.2	45.5	30.3
6	50.0	31.8	48.5	31.5	46.0	30.3
7	51.0	31.8	49.5	31.0	46.5	30.6
8	50.0	31.5	49.0	31.2	46.5	30.3
9	49.5	31.6	49.5	31.5	46.5	30.6
10	50.0	31.6	48.0	31.1	45.5	30.3
11	50.0	31.5	47.5	31.0	45.4	30.8
12	49.0	31.9	47.0	29.8	44.6	30.4
13	48.5	31.5	47.2	30.3	45.7	30.6
14	49.5	31.5	48.4	30.3	45.0	30.4
15	49.2	32.1	48.2	30.6	45.1	30.3
16	49.0	31.8	47.8	30.6	45.0	30.3
17	48.5	31.5	47.6	30.6	45.0	30.3
18	49.0	31.5	47.3	30.4	45.2	30.6
19	49.6	31.5	47.0	30.4	45.2	30.6
20	50.0	31.4	47.8	30.3	45.2	30.7
21	48.8	31.5	47.0	30.8	45.5	30.8
22	49.5	31.9	47.0	30.6	45.5	30.6
23	49.0	31.8	47.0	30.6	45.5	30.8
24	49.0	31.5	47.0	30.3	45.5	30.7
25	48.0	31.4	47.0	30.3	45.6	30.6
26	48.0	31.6	47.0	30.7	45.8	30.7
27	48.0	31.4	46.7	30.3	45.6	30.6
28	48.0	31.4	46.2	30.3	45.6	30.6
29	48.0	31.4	46.0	30.3	45.6	30.3
30	48.5	31.5	45.2	30.4	45.7	30.6
31	49.0	31.0	0.0	0.0	45.6	30.7
MEANS	48.9	31.6	47.8	30.7	45.6	30.5
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					46.5	31.2
MAXIMUM	51.0	32.1	49.7	31.5	46.5	30.8
MINIMUM	47.5	31.0	45.2	29.8	44.6	29.9
STD.DEV.	.63	.22	1.16	.42	.45	.22

KAINS ISLAND 50 26 39 N 128 01 47 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.5	28.0	44.3	30.3	44.7	29.8
2	46.9	30.3	44.2	30.2	44.8	30.2
3	46.2	29.8	43.7	30.3	44.1	29.7
4	45.8	28.8	44.1	30.6	43.7	28.1
5	45.9	29.1	43.9	30.8	44.0	28.2
6	45.1	29.1	44.2	31.1	44.1	29.4
7	44.8	29.5	44.1	30.8	44.4	29.5
8	44.6	30.2	44.1	30.8	44.2	28.6
9	44.0	29.4	42.9	30.0	44.5	29.1
10	44.3	29.9	43.1	30.2	44.8	29.7
11	45.1	30.7	43.2	30.4	45.0	30.3
12	45.7	29.9	44.2	31.0	44.8	30.2
13	45.1	29.7	43.4	30.7	44.5	30.3
14	44.4	29.1	44.1	30.7	45.0	30.3
15	44.2	30.0	44.3	30.8	45.2	30.3
16	45.6	30.3	43.7	30.8	45.1	29.8
17	45.7	29.9	44.4	31.0	45.1	29.9
18	44.9	29.7	44.5	30.8	45.8	30.0
19	45.1	29.0	43.8	31.0	45.0	30.2
20	45.4	28.5	43.8	31.0	45.2	29.7
21	45.0	28.5	43.7	31.1	45.0	28.6
22	45.7	28.8	44.7	30.8	45.2	29.7
23	44.9	29.3	44.0	30.2	44.7	30.0
24	44.9	28.9	43.7	29.7	44.5	29.9
25	44.3	27.8	44.1	30.2	44.2	29.8
26	44.6	29.4	44.5	30.3	45.1	30.2
27	44.7	29.5	44.1	29.8	44.9	30.7
28	45.0	30.0	44.3	29.9	45.2	30.2
29	45.6	30.2	0.0	0.0	45.8	30.6
30	45.3	28.8	0.0	0.0	45.3	30.7
31	44.8	28.9	0.0	0.0	45.7	30.7
MEANS	45.2	29.4	44.0	30.5	44.8	29.8
OBSVNS.	31	31	28	28	31	31
MAXIMUM	46.9	30.7	44.7	31.1	45.8	30.7
MINIMUM	44.2	27.8	42.9	29.7	43.7	28.1
STD.DEV.	.62	.70	.45	.41	.49	.68

KAINS ISLAND 50 26 39 N 128 01 47 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.3	30.6	48.6	31.2	50.7	31.8
2	44.7	30.8	47.6	31.9	51.9	31.8
3	44.4	30.6	47.3	31.4	48.7	31.6
4	45.0	30.7	48.6	31.5	49.7	31.8
5	45.5	29.7	48.2	31.5	49.8	31.9
6	46.5	30.6	48.7	31.4	51.7	31.6
7	46.7	30.7	48.4	31.5	51.7	31.8
8	46.5	30.8	49.1	31.5	51.0	32.1
9	47.2	31.0	49.9	31.8	51.1	31.9
10	47.2	31.0	49.1	31.9	52.4	32.1
11	46.9	30.8	48.9	31.8	51.7	32.3
12	47.2	31.0	50.1	31.5	48.9	32.1
13	46.6	31.0	49.7	31.6	50.1	32.1
14	47.3	31.1	50.6	31.6	49.4	32.4
15	47.3	31.2	50.4	31.5	50.3	32.1
16	48.2	31.5	50.2	31.8	50.8	31.6
17	46.2	31.5	49.1	31.8	50.6	31.8
18	47.4	31.1	50.2	31.8	51.6	32.0
19	47.6	31.2	50.1	31.6	52.8	32.3
20	46.6	31.4	49.7	31.5	51.8	31.9
21	46.5	31.4	48.8	31.8	48.4	32.3
22	47.4	31.4	48.9	31.6	49.1	32.4
23	47.3	31.1	49.7	31.6	50.6	32.8
24	47.1	30.8	48.2	31.5	50.1	32.0
25	47.9	31.0	49.0	31.8	50.9	32.7
26	46.6	31.2	48.7	31.8	51.5	32.8
27	46.7	31.4	49.6	31.9	51.3	32.6
28	47.4	31.5	51.4	32.0	50.9	32.7
29	47.4	31.2	51.6	31.9	51.4	32.5
30	46.0	31.2	52.7	32.0	52.2	32.8
31	0.0	0.0	53.1	31.1	0.0	0.0
MEANS	46.8	31.0	49.6	31.7	50.8	32.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	48.2	31.5	53.1	32.0	52.8	32.8
MINIMUM	44.4	29.7	47.3	31.1	48.4	31.6
STD.DEV.	.98	.37	1.35	.22	1.13	.39

KAINS ISLAND 50 26 39 N 128 01 47 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.1	32.8	52.8	32.7	54.5	30.7
2	53.8	32.4	53.5	32.3	54.6	31.2
3	54.2	32.3	52.4	32.4	54.4	31.2
4	55.1	32.1	53.0	32.4	54.4	31.5
5	54.2	32.5	53.0	32.3	54.4	32.0
6	52.8	32.9	53.1	32.3	54.6	31.8
7	53.2	33.0	53.2	32.5	54.0	32.3
8	52.7	32.8	53.2	32.4	53.3	32.0
9	52.3	32.7	54.0	32.3	53.3	32.4
10	52.7	32.5	55.7	31.6	52.6	32.4
11	52.7	32.4	54.8	31.2	52.2	32.3
12	52.6	32.3	55.0	31.6	52.0	32.7
13	53.6	32.8	55.4	31.9	53.3	32.5
14	52.7	32.5	53.5	32.3	53.5	32.8
15	52.8	32.5	53.8	32.4	51.6	32.8
16	53.7	32.9	54.0	32.5	51.8	32.8
17	53.8	32.4	53.9	32.5	51.7	32.7
18	52.8	32.4	54.8	32.1	50.6	32.8
19	55.0	32.4	54.6	32.0	52.2	32.5
20	55.2	31.6	53.9	32.4	53.1	32.6
21	56.4	32.5	54.3	31.8	54.8	32.8
22	56.0	32.7	53.2	32.3	54.7	32.5
23	57.4	32.7	53.4	32.4	53.4	32.8
24	56.0	32.7	53.4	32.3	52.7	32.7
25	56.4	32.5	52.6	32.1	54.6	32.5
26	56.8	32.7	52.0	32.0	54.3	32.0
27	57.5	32.4	53.0	32.3	54.0	32.1
28	57.2	32.7	52.6	32.3	55.1	32.4
29	56.0	32.5	53.0	30.8	54.5	32.1
30	55.4	32.4	54.0	29.4	54.2	32.1
31	55.4	32.4	54.5	28.4	0.0	0.0
MEANS	54.6	32.5	53.7	31.9	53.5	32.3
OBSVNS.	31	31	31	31	30	30
MAXIMUM	57.5	33.0	55.7	32.7	55.1	32.8
MINIMUM	52.3	31.6	52.0	28.4	50.6	30.7
STD.DEV.	1.72	.27	.90	.91	1.18	.54

KAINS ISLAND 50 26 39 N 128 01 47 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	55.6	31.6	50.3	30.7	46.6	28.5
2	54.7	32.1	50.4	31.0	48.4	30.7
3	53.7	32.5	50.6	31.2	46.8	29.4
4	53.6	32.3	49.2	28.0	46.6	29.3
5	52.7	31.8	48.8	26.8	47.0	29.5
6	52.6	31.6	49.7	30.3	46.6	29.3
7	52.3	31.6	49.2	29.1	47.2	29.4
8	52.1	31.5	46.9	28.8	46.7	28.4
9	52.3	31.6	47.8	27.8	46.3	27.7
10	52.7	31.0	48.2	27.6	44.6	27.2
11	52.6	30.7	48.9	28.1	45.7	27.8
12	53.1	30.7	49.0	27.3	46.5	29.1
13	53.0	30.6	49.1	26.5	45.1	28.6
14	52.7	31.1	48.7	26.8	46.1	29.3
15	52.4	31.5	48.7	28.9	44.9	28.6
16	52.7	31.6	47.5	28.6	44.7	28.9
17	51.9	30.8	45.1	21.3	44.7	29.3
18	51.4	31.6	46.4	23.4	45.6	29.3
19	51.3	31.5	46.4	25.8	45.4	29.8
20	50.6	31.0	47.1	27.3	45.7	30.2
21	50.1	26.9	47.7	27.3	45.7	30.0
22	49.9	29.3	47.6	27.3	45.8	30.2
23	50.7	30.3	47.2	26.5	46.0	29.8
24	50.0	30.3	47.8	26.5	46.7	29.8
25	50.3	31.1	47.8	27.3	46.8	28.5
26	49.7	30.8	47.8	28.2	47.0	29.9
27	49.3	30.3	46.9	28.0	46.7	29.9
28	49.1	29.9	46.6	28.2	46.4	28.8
29	48.6	29.3	46.0	28.5	46.2	28.9
30	49.3	29.8	46.7	29.0	46.0	29.0
31	50.5	30.7	0.0	0.0	45.0	28.9
MEANS	51.7	30.9	48.1	27.7	46.1	29.2
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					49.1	30.8
MAXIMUM	55.6	32.5	50.6	31.2	48.4	30.7
MINIMUM	48.5	26.9	45.1	21.3	44.6	27.2
STD.DEV.	1.71	.88	1.36	2.01	.87	.78

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	47.3	26.8	43.0	27.6	45.0	25.1
2	46.3	27.8	42.9	27.8	45.4	27.7
3	47.1	29.9	43.3	28.6	45.4	30.7
4	46.4	29.9	42.7	28.6	45.3	29.7
5	46.0	26.1	42.3	28.4	43.3	28.4
6	47.9	30.8	43.5	29.3	43.7	27.8
7	45.6	28.4	44.4	29.4	43.7	27.8
8	47.6	31.5	43.7	29.4	44.5	27.2
9	45.5	29.5	43.8	28.0	45.2	28.6
10	45.4	29.7	44.4	26.9	45.0	28.6
11	44.4	29.7	44.2	29.1	45.3	28.5
12	45.1	27.8	* 44.3	* 29.1	46.3	29.3
13	46.3	29.9	44.5	29.1	46.0	28.9
14	45.0	29.0	43.9	28.5	45.7	29.5
15	44.3	28.0	43.4	22.7	45.4	26.9
16	44.6	28.4	44.6	29.0	46.3	29.7
17	45.5	26.0	43.3	24.2	45.7	28.6
18	45.9	27.1	44.3	28.1	45.6	29.3
19	46.1	27.8	45.2	29.4	45.7	30.3
20	46.0	28.6	* 44.7	* 29.4	45.2	28.0
21	45.7	28.6	44.1	29.4	* 45.2	* 28.3
22	45.3	28.5	44.7	29.8	45.3	28.6
23	46.2	28.6	44.9	27.6	46.3	29.0
24	46.5	30.2	44.9	29.4	46.1	28.2
25	45.8	29.1	44.1	28.6	46.7	26.6
26	44.6	28.5	45.0	26.9	46.5	28.6
27	44.6	28.2	44.9	28.9	45.4	28.5
28	45.0	29.1	44.8	28.0	47.0	28.2
29	44.0	28.8	0.0	0.0	47.0	28.4
30	43.1	26.1	0.0	0.0	47.4	30.3
31	* 43.1	* 27.9	0.0	0.0	47.4	29.8
MEANS	45.6	28.7	44.0	28.3	45.6	28.6
OBSVNS.	30	30	26	26	30	30
MAXIMUM	47.9	31.5	45.2	29.8	47.4	30.7
MINIMUM	43.1	26.0	42.3	22.7	43.3	25.1
STD.DEV.	1.09	1.21	.80	1.58	1.01	1.11

AMPHITRITE POINT 48 55 16 N 125 32 17 W

DATE	APRIL TEMP	APRIL SAL	MAY TEMP	MAY SAL	JUNE TEMP	JUNE SAL 1975
1	46.2	29.3	47.3	31.6	50.3	31.8
2	46.6	30.3	47.8	31.2	49.9	31.9
3	46.2	29.1	* 47.8	* 30.6	48.4	32.1
4	46.2	28.5	47.7	30.0	50.2	27.6
5	46.1	28.9	48.4	31.0	50.4	28.9
6	45.0	28.6	48.0	31.1	49.7	29.9
7	46.6	29.4	49.3	30.6	50.7	30.6
8	46.0	29.7	50.0	30.4	52.5	29.9
9	47.4	29.5	51.6	30.3	51.4	31.1
10	46.4	29.5	49.6	31.5	52.1	31.2
11	48.6	30.3	51.3	31.0	52.8	30.8
12	49.5	29.9	52.8	30.7	52.0	31.4
13	48.7	30.3	52.7	30.3	51.7	31.6
14	49.6	30.2	52.9	29.7	52.2	30.6
15	49.3	30.2	52.1	30.3	50.2	31.9
16	46.3	30.4	51.3	30.7	50.3	31.9
17	49.4	30.7	51.7	28.4	54.3	30.8
18	46.7	30.2	49.5	31.0	53.9	30.8
19	47.1	31.0	50.1	31.0	52.3	30.6
20	47.2	31.1	50.9	31.0	52.7	30.4
21	48.2	31.0	50.0	30.4	50.7	31.6
22	47.4	30.4	51.2	30.6	52.3	30.6
23	47.7	30.3	49.8	30.7	52.4	29.7
24	47.3	28.9	49.5	31.1	50.1	31.1
25	46.4	30.8	* 50.3	* 31.1	51.1	30.0
26	46.7	31.0	51.1	31.0	52.3	31.1
27	47.6	31.5	51.4	30.8	50.6	31.6
28	48.7	30.8	52.3	31.1	50.7	31.8
29	49.1	31.2	51.7	31.0	50.9	31.9
30	49.5	31.2	52.7	31.2	52.5	31.1
31	0.0	0.0	54.3	30.4	0.0	0.0
MEANS	47.8	30.1	50.7	30.7	51.4	30.9
OBSVNS.	30	30	29	29	30	30
MAXIMUM	49.6	31.5	54.3	31.6	54.3	32.1
MINIMUM	45.0	28.5	47.3	28.4	48.4	27.6
STD.DEV.	1.18	.83	1.78	.62	1.32	1.00

AMPHITRITE POINT   48 55 16 N   125 32 17 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	51.1	31.8	52.5	32.0	52.9	30.0
2	52.0	31.5	52.2	31.9	52.7	30.2
3	51.7	31.4	52.5	31.5	54.6	28.1
4	53.4	30.8	54.5	31.5	55.0	29.1
5	54.5	30.3	53.6	31.8	58.0	28.4
6	54.1	30.6	53.3	32.0	59.3	28.1
7	52.6	31.5	55.0	31.2	55.4	30.7
8	54.3	31.4	56.7	31.2	56.2	30.0
9	51.7	31.9	56.8	31.0	58.7	30.3
10	51.2	31.9	56.7	31.2	59.3	29.8
11	52.4	31.6	56.3	31.0	61.3	28.6
12	52.6	31.9	57.1	31.0	57.6	30.4
13	53.7	31.4	57.2	31.1	57.3	29.5
14	55.1	31.0	56.6	31.2	56.9	29.4
15	52.9	31.9	55.2	31.2	55.3	30.2
16	52.0	31.9	56.0	29.9	53.7	30.8
17	54.1	31.5	55.3	26.5	54.4	31.0
18	54.2	31.4	54.6	29.9	56.2	30.4
19	53.6	31.6	54.8	31.0	55.3	30.4
20	53.7	31.5	55.1	30.7	54.2	30.8
21	54.0	31.2	53.0	31.6	55.5	30.8
22	54.5	31.5	52.6	31.1	55.3	30.4
23	55.7	31.2	54.7	29.5	55.7	30.4
24	56.7	31.0	54.3	30.4	55.7	30.4
25	56.5	31.1	54.5	31.0	53.4	31.1
26	54.5	31.8	53.2	18.3	54.4	30.7
27	51.9	31.6	54.2	27.7	54.7	30.8
28	53.4	32.1	53.8	28.2	53.5	31.1
29	53.3	31.8	54.3	28.6	54.1	31.1
30	55.5	31.5	53.0	29.0	53.2	31.0
31	55.9	31.6	55.2	26.8	0.0	0.0
MEANS	53.6	31.5	54.7	30.1	55.7	30.1
OBSVNS.	31	31	31	31	30	30
MAXIMUM	56.7	32.1	57.2	32.0	61.3	31.1
MINIMUM	51.1	30.3	52.2	18.3	52.7	28.1
STD.DEV.	1.51	.41	1.49	2.58	2.10	.89

AMPHITRITE POINT 48 55 16 N 125 32 17 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	54.4	30.8	52.6	29.5	48.7	28.9
2	54.0	30.8	52.4	29.1	48.7	25.6
3	52.0	30.8	52.7	26.0	48.8	25.6
4	51.3	30.8	52.5	27.1	49.5	29.8
5	52.4	29.3	51.9	25.9	47.9	27.2
6	52.7	30.3	* 51.8	* 26.7	47.3	27.3
7	52.2	29.8	* 51.7	* 27.5	47.0	27.8
8	52.3	30.6	51.5	26.4	48.2	25.6
9	* 53.2	* 30.0	49.7	24.0	48.3	28.2
10	54.1	30.6	51.1	28.5	* 47.3	* 27.3
11	54.3	29.8	50.1	25.2	46.3	26.4
12	53.7	28.8	* 50.5	* 26.4	44.4	25.2
13	54.4	26.0	* 50.9	* 27.6	48.4	29.5
14	53.7	27.4	51.4	28.9	46.1	25.4
15	53.3	30.0	* 50.5	* 27.4	47.8	29.4
16	53.2	28.9	49.6	25.8	45.7	28.0
17	53.8	28.5	49.9	26.5	46.8	29.8
18	53.5	28.9	47.3	22.6	47.0	30.0
19	53.7	29.8	49.3	27.3	46.2	29.5
20	53.5	29.7	49.5	27.7	46.2	29.7
21	53.2	28.4	48.1	25.2	* 0.0	* 0.0
22	52.5	26.4	50.3	28.9	* 0.0	* 0.0
23	51.8	25.6	49.2	22.2	* 0.0	* 0.0
24	50.1	23.1	50.6	29.1	* 0.0	* 0.0
25	52.9	29.8	49.5	28.0	47.5	30.0
26	51.5	25.8	50.2	26.4	* 47.3	* 30.1
27	51.7	27.3	46.8	26.2	47.1	30.3
28	50.0	17.4	47.6	28.1	46.9	28.9
29	* 51.1	* 24.0	46.0	28.0	47.2	22.6
30	52.3	30.7	45.5	26.9	47.3	29.7
31	51.0	24.6	0.0	0.0	45.3	27.2
MEANS	52.6	26.2	49.9	27.2	47.2	27.9
OBSVNS.	29	29	25	25	25	25
YRLY.MEANS................................					50.0	29.4
MAXIMUM	54.8	30.8	52.7	29.5	49.5	30.3
MINIMUM	50.0	17.4	45.5	22.2	44.4	22.6
STD.DEV.	1.23	3.22	1.95	2.01	1.21	2.03

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.2	* 0.0	45.1	* 0.0	45.1	* 0.0
2	46.3	* 0.0	45.0	* 0.0	44.9	* 0.0
3	46.2	* 0.0	45.0	* 0.0	44.8	* 0.0
4	46.0	* 0.0	44.9	* 0.0	44.9	* 0.0
5	45.9	* 0.0	44.6	* 0.0	* 44.9	* 0.0
6	46.0	* 0.0	44.3	* 0.0	44.9	* 0.0
7	46.2	* 0.0	44.1	* 0.0	44.8	* 0.0
8	46.2	* 0.0	43.8	* 0.0	44.8	* 0.0
9	46.1	* 0.0	43.6	* 0.0	44.7	* 0.0
10	45.0	* 0.0	43.9	* 0.0	44.8	* 0.0
11	44.8	* 0.0	44.3	* 0.0	44.9	* 0.0
12	45.0	* 0.0	44.4	* 0.0	45.0	* 0.0
13	45.3	* 0.0	44.3	* 0.0	45.1	* 0.0
14	45.4	* 0.0	44.3	* 0.0	45.1	* 0.0
15	45.3	* 0.0	44.4	* 0.0	45.0	* 0.0
16	45.3	* 0.0	44.3	* 0.0	45.0	* 0.0
17	45.2	* 0.0	44.2	* 0.0	44.9	* 0.0
18	45.3	* 0.0	44.3	* 0.0	44.9	* 0.0
19	* 45.2	* 0.0	44.4	* 0.0	45.0	* 0.0
20	45.1	* 0.0	44.5	* 0.0	45.0	* 0.0
21	45.1	* 0.0	44.3	* 0.0	44.9	* 0.0
22	44.8	* 0.0	44.3	* 0.0	45.1	* 0.0
23	44.8	* 0.0	44.3	* 0.0	45.2	* 0.0
24	45.0	* 0.0	44.4	* 0.0	45.1	* 0.0
25	45.1	* 0.0	44.5	* 0.0	45.1	* 0.0
26	44.9	* 0.0	* 44.6	* 0.0	45.0	* 0.0
27	44.6	* 0.0	45.0	* 0.0	45.1	* 0.0
28	44.9	* 0.0	45.0	* 0.0	45.2	* 0.0
29	45.0	* 0.0	0.0	0.0	45.3	* 0.0
30	44.9	* 0.0	0.0	0.0	45.2	* 0.0
31	* 45.0	* 0.0	0.0	0.0	45.3	* 0.0
MEANS	45.4	0.0	44.4	0.0	45.0	0.0
OBSVNS.	29	0	27	0	30	0
MAXIMUM	46.3	0.0	45.1	0.0	45.3	0.0
MINIMUM	44.6	0.0	43.6	0.0	44.7	0.0
STD.DEV.	.53	0.00	.36	0.00	.15	0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	APRIL			MAY			JUNE		1975
DATE	TEMP		SAL	TEMP		SAL	TEMP		SAL
1	45.3	*	0.0	46.9	*	0.0	49.6	*	0.0
2	45.2	*	0.0	46.9	*	0.0	49.6	*	0.0
3	45.4	*	0.0	47.0	*	0.0	49.7	*	0.0
4	45.4	*	0.0	47.1	*	0.0	49.8	*	0.0
5	45.4	*	0.0	46.9	*	0.0	49.8	*	0.0
6	45.5	*	0.0	47.0	*	0.0	49.9	*	0.0
7	45.5	*	0.0	47.1	*	0.0	49.9	*	0.0
8	45.6	*	0.0	47.2	*	0.0	49.8	*	0.0
9	45.6	*	0.0	47.1	*	0.0	50.2	*	0.0
10	45.7	*	0.0	47.2	*	0.0	50.4	*	0.0
11	45.6	*	0.0	47.2	*	0.0	50.4	*	0.0
12	45.8	*	0.0	47.4	*	0.0	49.8	*	0.0
13	45.9	*	0.0	47.4	*	0.0	49.5	*	0.0
14	46.0	*	0.0	47.6	*	0.0	49.2	*	0.0
15	46.0	*	0.0	47.5	*	0.0	49.8	*	0.0
16	46.1	*	0.0	47.6	*	0.0	50.0	*	0.0
17	46.4	*	0.0	47.7	*	0.0	50.1	*	0.0
18	46.5	*	0.0	47.7	*	0.0	50.1	*	0.0
19	46.7	*	0.0	47.8	*	0.0	50.2	*	0.0
20	46.6	*	0.0	47.8	*	0.0	50.3	*	0.0
21	46.7	*	0.0	47.8	*	0.0	50.2	*	0.0
22	46.7	*	0.0	47.9	*	0.0	49.8	*	0.0
23	46.5	*	0.0	47.6	*	0.0	49.8	*	0.0
24	46.5	*	0.0	47.8	*	0.0	49.6	*	0.0
25	46.7	*	0.0	47.8	*	0.0	49.4	*	0.0
26	46.7	*	0.0	47.6	*	0.0	49.2	*	0.0
27	46.6	*	0.0	47.8	*	0.0	49.2	*	0.0
28	46.8	*	0.0	47.6	*	0.0	49.0	*	0.0
29	46.7	*	0.0	47.9	*	0.0	48.8	*	0.0
30	46.6	*	0.0	48.4	*	0.0	49.0	*	0.0
31	0.0		0.0	49.1	*	0.0	0.0		0.0
MEANS	46.1		0.0	47.5		0.0	49.7		0.0
OBSVNS.	30		0	31		0	29		0
MAXIMUM	46.8		0.0	49.1		0.0	50.4		0.0
MINIMUM	45.2		0.0	46.9		0.0	48.8		0.0
STD.DEV.	.55		0.00	.47		0.00	.43		0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	JULY			AUGUST			SEPTEMBER 1975		
DATE	TEMP		SAL	TEMP		SAL	TEMP		SAL
1	49.2	*	0.0	53.1	*	0.0	49.8	*	0.0
2	49.2	*	0.0	52.6	*	0.0	49.7	*	0.0
3	50.4	*	0.0	53.0	*	0.0	50.9	*	0.0
4	51.2	*	0.0	54.6	*	0.0	52.3	*	0.0
5	53.4	*	0.0	52.8	*	0.0	50.9	*	0.0
6	52.6	*	0.0	52.6	*	0.0	49.8	*	0.0
7	52.3	*	0.0	51.2	*	0.0	50.7	*	0.0
8	52.9	*	0.0	50.9	*	0.0	50.8	*	0.0
9	51.7	*	0.0	49.7	*	0.0	50.6	*	0.0
10	51.9	*	0.0	50.6	*	0.0	50.6	*	0.0
11	50.2	*	0.0	50.1	*	0.0	49.8	*	0.0
12	51.7	*	0.0	50.5	*	0.0	50.2	*	0.0
13	49.5	*	0.0	50.7	*	0.0	50.6	*	0.0
14	51.6	*	0.0	50.3	*	0.0	49.6	*	0.0
15	* 50.2	*	0.0	50.9	*	0.0	50.3	*	0.0
16	46.5	*	0.0	51.6	*	0.0	50.4	*	0.0
17	50.2	*	0.0	51.2	*	0.0	50.7	*	0.0
18	50.3	*	0.0	51.2	*	0.0	51.8	*	0.0
19	50.2	*	0.0	51.1	*	0.0	49.9	*	0.0
20	50.3	*	0.0	50.8	*	0.0	51.7	*	0.0
21	51.2	*	0.0	50.7	*	0.0	51.5	*	0.0
22	* 50.5	*	0.0	50.6	*	0.0	51.4	*	0.0
23	49.6	*	0.0	50.7	*	0.0	50.9	*	0.0
24	50.2	*	0.0	50.8	*	0.0	50.6	*	0.0
25	50.6	*	0.0	50.4	*	0.0	50.2	*	0.0
26	50.6	*	0.0	50.2	*	0.0	51.3	*	0.0
27	51.2	*	0.0	50.6	*	0.0	50.8	*	0.0
28	51.4	*	0.0	50.2	*	0.0	50.2	*	0.0
29	52.1	*	0.0	50.1	*	0.0	50.0	*	0.0
30	52.6	*	0.0	50.7	*	0.0	50.9	*	0.0
31	52.4	*	0.0	51.4	*	0.0	0.0		0.0
MEANS	51.0		0.0	51.2		0.0	50.6		0.0
OBSVNS.	29		0	31		0	30		0
MAXIMUM	53.4		0.0	54.6		0.0	52.3		0.0
MINIMUM	46.5		0.0	49.7		0.0	49.6		0.0
STD.DEV.	1.23		0.00	1.12		0.00	.68		0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	OCTOBER			NOVEMBER				DECEMBER 1975			
DATE	TEMP		SAL		TEMP		SAL		TEMP		SAL
1	50.1	*	0.0		50.5	*	0.0		47.2	*	0.0
2	50.0	*	0.0		49.7	*	0.0		47.6	*	0.0
3	50.2	*	0.0		49.7	*	0.0		47.3	*	0.0
4	49.0	*	0.0		49.7	*	0.0		47.3	*	0.0
5	49.9	*	0.0		49.9	*	0.0		46.8	*	0.0
6	48.6	*	0.0		49.8	*	0.0		47.5	*	0.0
7	49.4	*	0.0		49.2	*	0.0		46.6	*	0.0
8	49.4	*	0.0		49.7	*	0.0		46.9	*	0.0
9	49.2	*	0.0		49.2	*	0.0		47.0	*	0.0
10	49.0	*	0.0		49.5	*	0.0	*	46.8	*	0.0
11	49.4	*	0.0		48.9	*	0.0		46.5	*	0.0
12	49.6	*	0.0		49.5	*	0.0	*	0.0	*	0.0
13	49.4	*	0.0		50.2	*	0.0	*	0.0	*	0.0
14	52.0	*	0.0		49.4	*	0.0	*	0.0	*	0.0
15	49.8	*	0.0	*	49.4	*	0.0	*	0.0	*	0.0
16	50.1	*	0.0		49.4	*	0.0		45.5	*	0.0
17	49.9	*	0.0		48.8	*	0.0		45.7	*	0.0
18	49.7	*	0.0		49.1	*	0.0		45.6	*	0.0
19	49.8	*	0.0		48.7	*	0.0		45.5	*	0.0
20	49.9	*	0.0	*	48.6	*	0.0		45.3	*	0.0
21	49.7	*	0.0		48.5	*	0.0		45.4	*	0.0
22	51.6	*	0.0		48.6	*	0.0		45.8	*	0.0
23	50.2	*	0.0		48.6	*	0.0		45.3	*	0.0
24	49.1	*	0.0		48.9	*	0.0		45.6	*	0.0
25	49.1	*	0.0		48.2	*	0.0		45.4	*	0.0
26	50.2	*	0.0		48.7	*	0.0		45.2	*	0.0
27	48.9	*	0.0		48.0	*	0.0	*	45.2	*	0.0
28	48.9	*	0.0		48.3	*	0.0		45.2	*	0.0
29	48.9	*	0.0		47.1	*	0.0		45.0	*	0.0
30	49.8	*	0.0		48.0	*	0.0		45.6	*	0.0
31	49.2	*	0.0		0.0		0.0		45.4	*	0.0
MEANS	49.7		0.0		49.1		0.0		46.1		0.0
OBSVNS.	31		0		28		0		25		0
YRLY.MEANS........									48.0		0.0
MAXIMUM	52.0		0.0		50.5		0.0		47.6		0.0
MINIMUM	48.6		0.0		47.1		0.0		45.0		0.0
STD.DEV.	.73		0.00		.76		0.00		.86		0.00

RACE ROCKS 48 17 57 N 123 31 48 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.3	32.1	44.5	32.0	45.0	32.0
2	45.9	31.8	* 44.4	* 32.0	45.2	31.8
3	46.0	32.0	44.2	31.9	45.0	31.5
4	46.1	31.9	44.1	32.0	44.7	31.6
5	46.0	32.0	44.1	31.8	44.7	31.5
6	45.6	32.0	44.0	31.6	44.5	31.6
7	45.5	32.0	43.8	31.6	44.3	31.4
8	45.4	31.8	43.5	31.5	44.4	31.4
9	44.9	31.9	43.5	31.9	44.8	31.5
10	44.4	31.6	44.2	31.8	45.0	31.5
11	44.5	31.8	44.0	31.5	45.3	31.5
12	45.0	31.8	44.1	31.5	45.3	31.5
13	45.4	31.8	44.3	31.8	45.5	31.6
14	45.0	31.8	44.4	31.8	45.1	31.6
15	44.5	31.6	44.5	31.6	45.3	31.6
16	* 45.0	* 31.8	44.2	31.5	45.4	31.8
17	45.5	32.1	44.3	31.1	45.1	31.6
18	* 45.5	* 31.9	44.2	31.2	44.8	31.9
19	* 45.4	* 31.7	44.0	31.1	44.7	31.8
20	45.4	31.5	43.9	31.5	44.6	31.6
21	44.7	31.5	43.7	31.1	44.9	31.8
22	45.3	31.6	44.3	31.2	44.8	31.6
23	45.2	31.4	44.5	31.2	44.9	31.5
24	45.2	31.4	44.8	31.4	45.0	31.5
25	45.1	31.5	44.7	31.6	45.0	31.4
26	45.2	31.6	44.9	31.5	45.2	31.2
27	44.4	31.5	45.0	32.3	45.1	31.4
28	44.9	31.4	45.1	32.0	45.3	31.5
29	44.8	31.6	0.0	0.0	46.0	31.8
30	44.9	32.0	0.0	0.0	* 45.5	* 31.7
31	44.7	32.0	0.0	0.0	45.0	31.5
MEANS	45.2	31.8	44.3	31.6	45.0	31.6
OBSVNS.	28	28	27	27	30	30
MAXIMUM	46.3	32.1	45.1	32.3	46.0	32.0
MINIMUM	44.4	31.4	43.5	31.1	44.3	31.2
STD.DEV.	.54	.23	.41	.32	.34	.17

RACE ROCKS 48 17 57 N 123 31 48 W

	APRIL		MAY		JUNE 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.1	31.4	46.6	32.5	48.6	31.9
2	45.3	31.5	46.6	32.3	49.0	32.0
3	45.4	31.5	46.4	32.0	49.2	31.9
4	45.5	31.5	46.6	32.1	49.7	31.9
5	44.9	31.2	46.8	32.0	50.0	31.9
6	45.2	31.4	47.1	32.1	50.1	31.8
7	45.5	31.5	47.4	32.0	49.9	32.1
8	46.0	31.4	48.0	31.8	48.8	32.4
9	46.2	31.5	48.4	32.0	49.6	32.3
10	46.4	31.6	48.3	32.0	48.9	32.5
11	46.3	31.6	48.0	32.1	48.7	32.3
12	46.4	31.6	48.0	32.3	48.7	32.3
13	46.1	31.6	47.6	32.1	48.6	32.4
14	45.5	31.4	47.8	32.0	48.6	32.3
15	45.7	32.0	47.7	32.1	49.3	32.1
16	45.7	32.0	47.7	32.0	49.0	32.4
17	45.6	32.5	47.6	32.0	49.4	32.0
18	45.7	32.4	47.5	32.1	49.1	32.0
19	45.5	32.1	47.6	32.4	49.2	32.1
20	45.6	32.3	48.2	32.4	48.9	32.1
21	* 46.0	* 32.3	47.7	32.3	49.0	32.3
22	46.4	32.3	47.9	32.1	49.1	32.0
23	46.7	32.1	48.1	32.0	48.6	32.3
24	46.6	32.3	46.5	32.3	48.6	32.4
25	46.3	32.6	48.0	32.3	48.8	32.5
26	46.4	32.7	48.2	32.1	48.5	32.3
27	46.3	32.8	48.3	32.4	48.6	32.3
28	46.2	32.9	48.5	32.1	48.8	32.3
29	46.5	32.7	* 48.4	* 32.1	50.2	32.0
30	46.5	32.6	48.2	32.1	48.3	32.1
31	0.0	0.0	49.1	32.3	0.0	0.0
MEANS	45.9	32.0	47.7	32.1	49.1	32.2
OBSVNS.	29	29	30	30	30	30
MAXIMUM	46.7	32.9	49.1	32.5	50.2	32.5
MINIMUM	44.9	31.2	46.4	31.8	48.3	31.8
STD.DEV.	.51	.54	.67	.17	.51	.20

RACE ROCKS 48 17 57 N 123 31 48 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.7	32.1	53.2	30.3	51.1	31.2
2	49.7	32.1	54.0	30.2	50.8	31.4
3	49.9	31.8	53.7	30.2	50.4	31.9
4	49.9	31.5	53.3	29.9	50.5	32.0
5	50.1	31.4	52.3	31.2	50.4	32.3
6	50.4	31.8	51.8	31.5	50.8	32.1
7	51.1	31.6	50.4	31.9	49.9	32.4
8	50.8	31.6	50.3	32.0	49.8	32.4
9	49.0	32.3	49.4	32.4	50.0	32.1
10	48.6	32.3	49.3	32.4	50.3	32.4
11	49.0	32.5	49.1	32.5	50.4	32.1
12	49.8	32.1	49.9	32.1	52.1	31.4
13	49.6	32.3	49.5	32.0	51.4	31.5
14	49.3	32.3	49.8	32.0	51.4	31.4
15	49.9	31.9	50.0	32.1	51.2	31.5
16	49.7	32.0	50.6	32.1	51.1	31.2
17	50.0	31.8	50.9	31.6	51.0	31.4
18	50.3	31.8	50.7	31.9	51.2	31.2
19	50.5	31.8	50.7	31.8	51.4	31.4
20	50.4	31.9	50.5	31.9	51.2	31.2
21	50.3	31.9	50.2	32.0	51.5	31.5
22	50.2	32.1	50.2	31.9	51.1	31.5
23	50.7	32.4	50.3	32.0	51.0	31.5
24	50.3	32.3	50.2	31.6	50.2	31.6
25	50.1	32.0	50.4	31.5	50.1	31.6
26	51.0	31.9	50.8	31.9	49.9	31.8
27	51.4	31.6	50.6	32.1	50.0	31.6
28	51.7	31.4	50.3	32.0	50.2	31.8
29	52.3	31.2	50.2	31.8	50.8	31.6
30	53.0	30.7	50.8	31.9	51.0	31.6
31	53.3	30.0	50.3	31.6	0.0	0.0
MEANS	50.4	31.8	50.8	31.7	50.7	31.7
OBSVNS.	31	31	31	31	30	30
MAXIMUM	53.3	32.5	54.0	32.5	52.1	32.4
MINIMUM	48.6	30.0	49.1	29.9	49.8	31.2
STD.DEV.	1.08	.51	1.27	.66	.59	.36

RACE ROCKS 48 17 57 N 123 31 48 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.0	31.5	49.1	32.4	47.2	30.8
2	50.7	31.5	49.3	32.5	47.4	31.2
3	49.9	31.8	49.5	32.8	47.2	31.1
4	50.0	31.9	49.8	32.8	47.3	31.2
5	49.5	32.0	49.0	32.0	47.3	31.0
6	49.5	32.3	49.2	32.0	47.2	31.0
7	49.3	32.1	* 49.2	* 32.0	47.3	31.1
8	48.7	32.1	* 49.1	* 32.1	47.0	31.1
9	48.7	32.1	49.1	32.1	46.8	31.0
10	48.8	32.3	49.0	31.9	46.4	30.8
11	48.5	32.9	49.1	31.8	46.0	30.7
12	49.0	32.5	49.2	31.6	46.0	30.4
13	49.1	32.1	49.4	31.6	46.1	30.4
14	49.4	32.0	49.2	31.2	45.9	30.2
15	49.9	31.9	48.8	31.0	45.7	30.3
16	49.8	32.0	49.1	31.1	45.3	30.3
17	49.6	32.0	49.3	30.8	45.5	30.3
18	49.0	32.1	49.0	30.8	45.5	30.6
19	48.8	32.0	48.7	30.8	45.2	30.7
20	49.2	32.3	48.8	30.6	45.9	30.7
21	49.3	32.1	48.7	30.8	45.3	31.0
22	49.4	32.3	48.3	30.7	45.5	31.1
23	49.5	32.4	48.5	31.0	45.8	31.5
24	49.1	32.0	48.5	31.0	46.0	31.5
25	49.0	32.0	47.9	31.2	46.0	31.2
26	48.9	32.1	47.8	31.2	45.8	31.4
27	49.2	32.1	47.6	31.0	45.9	31.2
28	49.0	32.3	47.2	30.8	45.7	31.1
29	49.0	32.3	46.7	30.4	45.5	31.2
30	49.0	32.4	46.9	30.7	45.3	31.0
31	49.1	32.3	0.0	0.0	45.4	31.0
MEANS	49.3	32.1	48.7	31.4	46.1	30.9
OBSVNS.	31	31	28	28	31	31
YRLY.MEANS..					47.8	31.7
MAXIMUM	51.0	32.9	49.8	32.8	47.4	31.5
MINIMUM	48.5	31.5	46.7	30.4	45.2	30.2
STD.DEV.	.56	.27	.60	.70	.74	.36

CAPE MUDGE 49 59 56 N 125 11 38 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1975
1	47.8	29.1	43.3	29.0	45.0	29.1
2	* 45.6	* 29.0	43.9	29.1	* 44.8	* 29.1
3	43.4	28.9	* 43.7	* 29.1	44.6	29.0
4	43.9	28.9	43.4	29.1	44.9	29.3
5	* 44.7	* 28.9	43.9	28.9	45.2	29.0
6	45.5	28.8	44.2	28.8	46.6	29.0
7	41.8	27.6	43.9	29.0	46.3	28.9
8	44.3	28.2	45.2	29.1	45.4	29.1
9	44.9	28.5	43.3	28.9	47.0	29.7
10	45.9	29.1	44.0	28.8	46.8	29.3
11	* 45.0	* 29.2	44.6	29.1	46.3	29.4
12	45.7	29.3	44.7	28.9	46.2	29.3
13	45.3	29.7	41.3	29.1	47.4	29.7
14	42.3	28.4	41.4	29.4	* 46.4	* 29.6
15	41.5	28.6	* 42.1	* 29.3	* 45.3	* 29.5
16	44.3	28.9	42.8	29.1	44.2	29.4
17	45.2	29.0	42.9	28.4	* 44.5	* 29.3
18	43.2	29.0	44.4	29.3	44.8	29.1
19	44.8	28.6	44.3	28.5	44.7	29.0
20	44.4	29.1	42.8	28.4	* 44.2	28.9
21	45.3	29.5	43.2	28.6	* 45.2	* 29.0
22	44.6	28.9	* 44.5	* 28.6	46.2	29.1
23	45.3	28.2	45.9	28.6	46.7	29.5
24	45.4	28.6	46.2	29.1	47.1	28.6
25	45.7	28.9	46.2	28.9	47.3	28.9
26	45.7	28.8	46.7	29.1	48.4	29.0
27	45.3	29.0	45.4	29.8	47.8	29.3
28	44.9	29.1	44.8	29.3	47.3	29.4
29	45.2	29.3	0.0	0.0	47.1	29.3
30	* 44.6	* 29.2	0.0	0.0	* 45.1	* 29.2
31	* 44.0	* 29.1	0.0	0.0	43.1	29.1
MEANS	44.7	28.8	44.1	29.0	46.0	29.2
OBSVNS.	26	26	25	25	25	25
MAXIMUM	47.8	29.7	46.7	29.8	48.4	29.7
MINIMUM	41.5	27.6	41.3	28.4	43.1	28.6
STD.DEV.	1.38	.44	1.38	.32	1.33	.26

CAPE MUDGE 49 59 56 N 125 11 38 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.7	29.3	47.6	29.5	50.2	29.3
2	45.2	29.4	48.3	29.3	55.1	28.8
3	* 45.4	* 29.3	* 48.7	* 29.3	* 55.8	* 28.8
4	45.8	29.1	49.1	29.4	* 56.6	* 28.8
5	46.9	29.5	51.6	29.4	57.4	28.8
6	47.7	29.4	50.9	29.4	56.9	28.4
7	48.4	29.4	51.3	29.4	56.9	28.5
8	49.4	29.4	52.9	29.7	60.2	27.8
9	50.2	29.3	51.6	29.7	55.6	28.6
10	48.7	29.4	48.8	29.8	53.9	29.1
11	48.3	29.4	51.3	29.4	53.8	28.9
12	49.9	29.5	53.2	29.4	50.7	29.1
13	48.8	29.5	53.4	29.3	51.3	29.3
14	45.2	29.7	51.3	29.3	48.9	29.4
15	46.3	29.7	48.3	29.4	49.8	28.6
16	46.4	29.7	48.5	29.5	51.1	29.3
17	48.8	29.8	48.3	29.7	52.2	29.8
18	47.4	29.5	49.6	29.4	51.2	29.9
19	46.9	29.5	51.2	29.3	57.9	29.9
20	48.2	29.4	51.3	29.5	56.1	29.4
21	50.8	29.5	51.6	29.4	56.6	29.0
22	* 50.9	* 29.5	50.7	29.0	* 55.7	* 29.2
23	* 51.2	* 29.5	50.2	29.3	54.8	29.4
24	51.5	29.5	52.9	29.5	* 54.1	* 29.0
25	50.4	29.5	51.9	29.4	53.3	28.6
26	51.4	29.4	51.6	29.4	57.0	28.5
27	49.7	29.7	50.5	29.5	55.4	28.0
28	48.4	29.5	50.7	29.5	56.6	28.1
29	45.6	29.5	48.2	29.5	52.0	28.2
30	46.9	29.7	48.3	29.7	56.8	28.6
31	0.0	0.0	49.4	29.5	0.0	0.0
MEANS	48.0	29.5	50.5	29.5	54.1	28.9
OBSVNS.	27	27	30	30	26	26
MAXIMUM	51.5	29.8	53.4	29.8	60.2	29.9
MINIMUM	44.7	29.1	47.6	29.0	48.9	27.8
STD.DEV.	1.96	.15	1.67	.16	3.02	.57

CAPE MUDGE 49 59 56 N 125 11 38 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.5	27.7	52.5	27.6	58.6	27.3
2	59.6	27.4	* 52.7	* 27.6	57.3	27.4
3	59.3	27.3	* 52.9	* 27.7	57.8	27.8
4	60.5	27.8	53.2	27.8	56.2	27.8
5	57.6	28.0	56.2	27.7	57.0	28.1
6	56.9	28.4	55.8	27.7	57.7	27.3
7	57.3	28.8	* 56.7	* 27.7	53.2	28.5
8	58.6	28.5	57.7	27.7	53.0	27.6
9	59.7	28.0	56.5	27.2	49.3	28.6
10	58.6	28.4	56.6	27.2	50.2	29.0
11	61.1	27.6	57.1	27.4	51.3	28.8
12	59.6	27.3	54.9	27.4	54.7	28.2
13	60.9	26.5	56.7	27.6	53.6	28.5
14	61.1	26.3	56.7	27.7	50.4	27.7
15	60.8	25.8	* 56.3	* 27.7	54.4	27.7
16	61.3	25.9	55.8	27.8	55.0	28.1
17	* 62.8	* 25.4	53.4	28.2	52.9	28.9
18	64.4	24.8	58.3	27.4	50.4	29.4
19	60.4	24.7	60.3	27.6	53.8	29.0
20	66.2	23.4	55.2	28.4	54.1	28.9
21	59.7	25.0	* 55.1	* 28.1	54.6	28.9
22	55.9	26.4	55.0	27.7	51.2	29.3
23	56.9	26.0	55.2	28.5	51.9	29.4
24	57.3	25.5	54.6	28.0	51.3	28.6
25	58.7	25.5	54.4	27.2	* 52.0	* 28.4
26	64.6	25.1	* 53.8	* 27.5	52.7	28.1
27	58.3	24.4	53.2	27.8	54.6	28.5
28	51.2	27.6	* 54.4	* 27.8	54.8	28.8
29	50.9	28.0	* 55.6	* 27.7	55.9	28.6
30	50.8	28.5	56.9	27.7	56.2	28.4
31	54.4	28.4	57.4	27.3	0.0	0.0
MEANS	58.8	26.8	55.8	27.7	54.1	28.4
OBSVNS.	30	30	23	23	29	29
MAXIMUM	66.2	28.8	60.3	28.5	58.6	29.4
MINIMUM	50.8	23.4	52.5	27.2	49.3	27.3
STD.DEV.	3.63	1.48	1.84	.35	2.48	.62

CAPE MUDGE 49 59 56 N 125 11 38 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	56.4	28.8	49.0	29.3	46.2	28.1
2	* 55.1	* 28.9	48.8	29.1	* 46.2	* 27.9
3	* 53.8	* 29.1	* 48.7	* 28.7	46.2	27.6
4	52.5	29.3	* 48.6	* 28.3	45.4	27.3
5	53.1	29.4	48.4	27.8	43.4	26.9
6	52.0	28.9	* 48.3	* 27.7	44.0	26.0
7	52.4	28.5	48.2	27.6	44.3	26.4
8	* 52.0	* 28.5	47.7	27.2	45.3	27.7
9	* 51.6	* 28.5	46.8	27.3	44.9	26.7
10	51.2	28.5	47.4	26.9	44.4	26.8
11	51.9	28.5	* 0.0	* 0.0	43.7	26.9
12	51.7	28.4	* 0.0	* 0.0	43.8	26.4
13	53.2	28.6	* 0.0	* 0.0	43.9	27.2
14	* 53.2	* 28.8	48.1	26.8	* 44.7	* 27.5
15	53.1	29.0	47.8	26.7	45.6	27.8
16	* 51.8	* 29.0	46.9	26.1	45.7	28.1
17	50.4	29.0	48.0	26.4	46.1	28.4
18	* 50.5	* 29.0	47.8	26.5	45.4	28.4
19	50.7	29.0	47.4	26.9	45.8	28.4
20	50.3	28.8	47.2	26.5	46.0	28.6
21	50.9	28.8	46.4	26.7	44.0	27.7
22	49.7	28.6	* 46.4	* 26.6	44.5	27.7
23	49.4	28.6	46.3	26.5	* 45.0	* 27.9
24	47.9	27.7	46.0	26.0	45.6	28.1
25	* 0.0	* 0.0	46.5	26.8	* 45.3	* 28.0
26	* 0.0	* 0.0	46.4	27.1	* 45.0	* 27.9
27	* 0.0	* 0.0	45.1	26.4	44.7	27.7
28	46.2	28.2	45.7	26.9	* 45.3	* 27.7
29	46.6	27.7	43.8	26.7	45.9	27.7
30	49.7	28.4	45.6	26.8	44.6	25.6
31	* 49.4	* 28.8	0.0	0.0	45.8	28.1
MEANS	51.1	28.6	47.0	27.0	45.0	27.5
OBSVNS.	20	20	23	23	25	25
YRLY.MEANS....................................					50.1	28.4
MAXIMUM	56.4	29.4	49.0	29.3	46.2	28.6
MINIMUM	46.6	27.7	43.8	26.0	43.4	25.6
STD.DEV.	2.21	.44	1.26	.81	.69	.81

SISTERS ISLAND 49 29 13 N 124 26 00 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.7	29.0	43.4	29.8	43.8	29.5
2	44.1	28.4	43.8	29.8	44.0	29.1
3	44.3	28.9	42.3	29.3	43.5	29.1
4	44.4	28.9	42.1	29.3	43.6	29.4
5	44.3	28.8	42.3	29.3	43.4	29.1
6	44.0	28.8	43.1	29.4	43.1	29.1
7	43.9	28.9	42.3	29.4	43.9	29.4
8	44.1	28.8	42.6	29.7	44.4	29.5
9	43.9	29.0	42.3	29.3	45.0	29.7
10	43.6	28.9	42.4	29.7	44.8	29.7
11	43.4	28.8	42.4	29.9	45.1	29.8
12	43.5	29.0	41.9	29.7	44.8	29.7
13	43.5	29.4	42.5	29.3	45.4	30.0
14	43.4	29.4	42.4	29.7	44.8	29.7
15	43.5	29.3	42.5	29.7	43.8	30.3
16	43.3	29.0	42.7	29.5	43.8	30.2
17	44.0	29.1	42.8	29.5	44.5	30.3
18	43.9	29.0	43.0	29.4	44.3	29.5
19	44.0	29.0	43.0	29.3	44.3	29.6
20	44.0	29.0	43.0	29.4	45.1	29.8
21	44.0	29.0	43.2	29.4	44.9	29.7
22	43.9	29.0	43.6	29.4	44.9	29.8
23	44.3	29.1	44.4	29.5	45.1	29.5
24	44.2	29.1	44.0	29.4	45.0	29.4
25	44.0	29.0	44.0	29.7	45.5	29.9
26	44.2	29.1	44.5	29.5	44.9	29.7
27	43.5	29.0	43.5	29.4	44.9	29.4
28	43.8	29.3	43.5	29.4	45.4	29.4
29	42.3	29.0	0.0	0.0	44.9	29.4
30	42.7	29.3	0.0	0.0	44.2	29.7
31	43.5	29.4	0.0	0.0	44.5	29.5
MEANS	43.8	29.0	43.0	29.5	44.5	29.6
OBSVNS.	31	31	28	28	31	31
MAXIMUM	44.7	29.4	44.5	29.9	45.5	30.3
MINIMUM	42.3	28.4	41.9	29.3	43.1	29.1
STD.DEV.	.51	.21	.71	.16	.64	.32

SISTERS ISLAND   49 29 13 N   124 26 00 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.5	29.7	49.0	29.5	59.5	28.1
2	44.5	29.5	48.5	29.5	58.5	28.6
3	44.6	29.1	48.0	29.8	56.5	28.5
4	44.9	29.4	48.9	29.5	56.5	28.8
5	45.3	29.7	50.0	29.6	58.7	28.8
6	46.2	29.4	50.5	29.9	57.8	28.4
7	47.4	29.7	49.5	30.0	59.1	28.6
8	48.5	29.7	52.4	29.5	56.5	28.8
9	49.9	29.7	54.0	29.3	56.7	28.8
10	49.1	29.7	52.4	28.9	56.2	28.9
11	49.0	29.1	52.3	30.2	56.0	29.0
12	47.6	29.4	54.5	29.8	55.6	28.9
13	46.9	29.7	53.2	29.7	56.0	29.1
14	48.3	29.9	51.1	29.9	57.8	28.9
15	48.6	29.9	51.6	29.9	57.0	29.1
16	48.3	30.0	50.6	29.9	56.5	29.7
17	48.4	29.3	49.7	29.7	56.7	29.8
18	48.6	29.8	50.2	29.8	59.7	28.0
19	47.5	29.8	49.6	29.5	62.1	27.1
20	47.4	29.7	52.5	29.6	61.1	27.3
21	47.4	29.9	51.0	29.5	60.2	26.9
22	47.4	29.5	50.5	29.4	57.2	27.1
23	47.6	29.5	51.0	29.3	57.7	23.8
24	48.4	29.5	52.0	29.4	58.0	22.4
25	47.6	29.7	52.3	29.3	57.0	21.4
26	47.7	29.5	52.5	29.1	56.4	23.7
27	47.3	29.7	51.8	29.1	56.2	22.4
28	48.6	29.5	53.5	29.1	56.0	22.6
29	47.0	29.4	55.4	29.3	57.5	21.3
30	48.3	29.8	56.4	29.5	59.0	22.6
31	0.0	0.0	56.5	28.0	0.0	0.0
MEANS	47.4	29.6	51.7	29.5	57.7	26.9
OBSVNS.	30	30	31	31	30	30
MAXIMUM	49.9	30.0	56.5	30.2	62.1	29.8
MINIMUM	44.5	29.1	48.0	28.0	55.6	21.3
STD.DEV.	1.42	.22	2.18	.42	1.63	2.81

SISTERS ISLAND 49 29 13 N 124 26 00 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	61.0	25.0	64.7	25.9	57.9	25.0
2	61.0	24.3	63.1	25.6	59.0	25.8
3	60.0	24.3	62.1	25.8	58.4	26.3
4	63.0	25.4	62.8	25.9	60.2	26.5
5	66.5	25.1	62.7	26.0	61.5	26.4
6	67.5	25.6	62.2	26.0	60.2	25.4
7	64.2	25.1	61.3	25.2	59.5	26.5
8	68.5	24.2	* 61.5	* 23.4	59.0	26.4
9	69.3	23.4	61.7	21.6	57.5	26.9
10	67.8	22.9	61.8	21.3	58.0	27.3
11	66.4	22.9	61.5	22.5	57.3	27.3
12	66.0	23.0	61.3	23.5	61.0	26.8
13	65.4	23.9	61.7	25.1	61.5	26.9
14	63.2	20.9	63.5	25.8	59.4	28.0
15	62.7	19.4	64.5	25.1	59.3	27.8
16	63.2	18.4	63.3	25.9	59.5	27.6
17	62.5	20.1	64.1	26.1	59.5	28.6
18	63.6	19.2	63.4	25.9	58.6	27.8
19	63.4	20.6	63.2	25.8	58.7	28.0
20	64.8	20.5	61.5	25.9	58.6	27.8
21	65.4	20.5	62.4	25.8	57.5	28.9
22	65.8	21.2	59.7	25.4	57.4	29.0
23	65.5	21.7	60.4	26.0	58.1	28.0
24	65.4	21.4	59.5	26.4	57.9	28.6
25	66.6	22.9	59.2	26.3	57.1	28.8
26	67.2	23.3	58.0	26.5	56.2	28.5
27	66.8	26.3	58.0	26.5	57.5	28.6
28	61.2	25.4	55.2	27.2	57.5	28.2
29	61.1	25.4	56.5	26.3	56.8	28.4
30	60.6	25.9	56.5	26.3	57.7	28.6
31	62.3	25.6	58.2	24.3	0.0	0.0
MEANS	64.7	23.0	61.1	25.4	58.6	27.5
OBSVNS.	31	31	30	30	30	30
MAXIMUM	69.3	26.3	64.7	27.2	61.5	29.0
MINIMUM	60.0	18.4	55.2	21.3	56.2	25.0
STD.DEV.	2.49	2.28	2.51	1.41	1.36	1.04

SISTERS ISLAND 49 29 13 N 124 26 00 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.0	28.4	49.2	27.1	44.7	26.8
2	57.0	28.2	49.0	27.1	46.0	27.3
3	55.5	28.4	49.5	27.4	45.7	27.4
4	55.6	28.1	49.8	27.6	44.5	26.7
5	52.6	28.8	48.8	27.4	44.0	26.9
6	51.4	28.6	48.8	27.4	44.3	26.7
7	52.2	28.0	48.4	27.6	44.5	26.7
8	52.5	28.0	48.0	27.7	44.6	26.7
9	51.5	28.2	47.7	27.7	43.9	25.9
10	51.5	27.8	47.5	27.6	44.3	26.8
11	51.6	28.0	47.8	27.7	43.6	26.7
12	53.7	27.4	48.0	27.7	43.8	27.3
13	52.9	27.8	48.0	27.8	44.0	27.1
14	53.4	28.1	48.5	27.7	44.2	27.6
15	52.7	28.4	47.4	27.1	44.0	27.6
16	50.5	29.3	47.3	26.4	44.0	27.4
17	51.3	29.4	47.0	27.6	43.6	27.2
18	51.2	28.6	47.0	28.1	43.5	27.3
19	51.4	28.4	46.4	28.1	43.2	27.2
20	51.4	28.5	47.3	28.5	43.5	27.1
21	50.3	29.1	46.3	28.2	42.8	27.1
22	50.2	28.9	46.5	28.1	43.2	27.2
23	50.3	29.1	46.4	28.0	40.5	27.4
24	50.0	28.9	46.3	28.4	41.0	27.3
25	49.4	29.4	46.2	27.4	43.2	27.4
26	49.6	29.1	45.7	26.7	44.8	27.4
27	49.3	29.5	45.8	27.7	43.8	27.3
28	49.5	29.1	44.5	27.2	44.3	27.1
29	48.7	26.4	44.6	27.8	44.0	27.1
30	48.7	26.4	44.4	27.1	44.5	27.2
31	49.0	26.7	0.0	0.0	45.0	27.3
MEANS	51.7	28.4	47.3	27.6	43.9	27.1
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					51.3	27.8
MAXIMUM	59.0	29.5	49.8	28.5	46.0	27.6
MINIMUM	48.7	26.4	44.4	26.4	40.5	25.9
STD.DEV.	2.44	.82	1.43	.47	1.10	.35

CHROME ISLAND 49 28 20 N 124 40 57 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1975
1	45.5	29.0	44.8	31.0	44.0	29.8
2	45.6	29.5	44.5	30.2	44.1	29.9
3	45.4	29.5	43.4	29.7	44.6	30.6
4	44.6	29.1	42.2	29.4	43.4	28.0
5	45.2	29.3	43.0	29.0	43.7	27.4
6	45.1	29.3	42.9	29.1	44.1	29.3
7	44.3	29.5	42.9	30.2	43.8	29.1
8	44.2	28.9	42.1	28.6	44.5	29.0
9	43.5	28.9	42.9	29.1	45.0	29.7
10	43.7	28.9	42.3	29.3	44.9	29.9
11	43.2	28.8	42.4	29.8	44.7	30.0
12	44.2	29.3	42.4	29.3	44.7	29.9
13	44.0	30.0	42.7	29.4	44.8	29.9
14	43.5	29.3	41.3	29.3	44.6	30.3
15	44.0	29.4	42.4	29.8	44.4	30.3
16	43.5	29.7	43.4	29.9	44.7	30.4
17	44.2	29.3	43.7	29.9	45.3	30.6
18	43.7	29.3	43.8	29.9	45.3	30.7
19	43.6	29.0	44.0	30.0	45.2	30.7
20	43.3	29.8	43.9	30.7	45.0	29.8
21	43.4	28.6	44.0	29.7	45.0	30.6
22	43.7	29.4	44.0	30.0	45.5	29.8
23	44.5	29.8	44.2	29.8	45.7	29.9
24	44.5	29.8	44.4	29.0	45.6	31.1
25	44.3	30.0	44.2	29.5	46.3	28.8
26	43.5	29.1	44.3	29.7	45.3	30.2
27	43.5	29.4	44.2	29.5	45.1	29.8
28	43.7	29.5	44.0	28.8	45.4	30.2
29	43.5	29.3	0.0	0.0	45.5	30.7
30	43.5	29.4	0.0	0.0	45.1	30.4
31	44.3	30.7	0.0	0.0	45.0	29.4
MEANS	44.1	29.4	43.4	29.6	44.8	29.9
OBSVNS.	31	31	28	28	31	31
MAXIMUM	45.8	30.7	44.8	31.0	46.3	31.1
MINIMUM	43.2	28.6	41.3	28.6	43.4	27.4
STD.DEV.	.71	.42	.90	.54	.64	.80

CHROME ISLAND 49 28 20 N 124 40 57 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.4	29.9	48.6	30.7	59.4	28.6
2	44.7	30.0	48.0	30.3	59.8	27.1
3	45.0	29.8	47.2	30.3	58.6	30.2
4	44.5	30.6	48.0	30.3	54.0	30.8
5	46.0	28.9	49.6	29.9	56.4	30.4
6	46.5	29.3	48.9	30.0	57.4	27.2
7	47.0	30.0	50.4	31.0	55.4	29.9
8	47.7	30.3	50.6	31.0	56.6	29.0
9	48.4	30.2	52.2	29.7	59.6	29.3
10	48.4	30.2	49.9	30.8	61.3	28.6
11	46.3	30.6	51.6	29.8	56.4	29.3
12	49.9	30.4	49.4	29.8	58.8	29.4
13	48.4	29.5	50.5	30.2	59.7	29.0
14	48.5	30.4	52.3	29.7	61.0	28.6
15	47.9	29.9	50.7	29.3	57.9	29.7
16	47.5	29.8	48.2	29.9	57.2	29.3
17	47.3	30.8	48.2	30.6	58.4	29.0
18	47.4	29.8	48.0	30.7	60.6	29.5
19	46.5	31.0	49.5	30.3	60.0	29.3
20	47.7	29.0	51.2	29.5	60.0	29.0
21	46.7	30.3	51.5	29.9	58.9	29.8
22	46.2	30.8	51.6	30.3	54.0	30.8
23	46.5	30.3	51.6	31.0	56.8	29.9
24	46.5	30.6	54.0	30.2	59.0	27.6
25	46.7	30.6	54.0	30.4	55.6	27.3
26	46.9	30.6	54.6	30.4	55.0	28.9
27	47.4	31.0	53.6	30.8	55.7	29.7
28	47.9	30.3	55.4	30.6	55.7	28.1
29	47.6	30.8	53.6	30.7	56.6	26.4
30	47.4	30.7	53.8	31.0	58.8	25.0
31	0.0	0.0	56.8	25.6	0.0	0.0
MEANS	47.1	30.2	51.1	30.2	57.9	28.9
OBSVNS.	30	30	31	31	30	30
MAXIMUM	49.9	31.0	56.8	31.0	61.3	30.8
MINIMUM	44.4	28.9	47.2	25.6	54.0	25.0
STD.DEV.	1.29	.55	2.49	.97	2.05	1.30

CHROME ISLAND 49 28 20 N 124 40 57 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	61.6	23.9	64.7	26.0	59.2	25.0
2	63.1	24.0	64.4	26.1	59.3	24.4
3	65.5	24.8	64.3	28.2	58.7	26.1
4	66.4	25.5	59.0	28.0	59.9	26.8
5	67.5	25.0	59.0	27.7	60.2	26.3
6	66.7	25.2	55.6	29.0	61.1	26.9
7	68.9	25.9	53.6	28.8	59.9	28.0
8	67.2	26.1	* 55.2	* 28.2	59.5	27.3
9	65.4	26.5	56.8	27.6	58.3	27.2
10	68.7	26.4	61.6	27.7	58.9	28.2
11	66.4	26.7	58.6	27.1	59.1	28.1
12	66.2	26.9	60.7	24.4	58.3	28.8
13	63.2	27.1	62.8	24.7	59.9	28.1
14	64.0	26.9	63.2	25.1	60.0	28.4
15	62.4	27.6	62.8	25.9	61.4	28.4
16	61.5	27.6	60.1	27.2	60.2	28.2
17	60.5	28.2	59.0	27.4	60.0	28.4
18	58.4	29.0	61.4	27.2	59.6	28.8
19	58.8	28.9	62.4	27.2	59.5	29.1
20	64.4	26.4	60.2	26.2	59.2	28.5
21	67.0	21.7	60.8	27.4	58.7	28.5
22	67.0	22.0	58.9	27.7	60.7	28.6
23	65.4	24.0	59.0	27.7	59.2	28.2
24	62.3	26.1	59.3	28.0	55.3	29.5
25	64.5	25.1	59.5	28.0	55.3	29.5
26	64.5	25.1	57.5	27.6	55.4	29.8
27	65.8	24.0	56.7	28.8	57.4	29.8
28	63.3	26.0	55.2	29.3	57.6	30.0
29	63.0	25.4	53.3	29.8	57.8	29.8
30	63.4	24.8	53.2	29.5	60.8	29.8
31	64.8	25.6	55.5	29.8	0.0	0.0
MEANS	64.5	25.8	59.3	27.6	59.0	28.2
OBSVNS.	31	31	30	30	30	30
MAXIMUM	68.7	29.0	64.7	29.8	61.4	30.0
MINIMUM	58.4	21.7	53.2	24.4	55.3	24.4
STD.DEV.	2.69	1.71	3.28	1.39	1.58	1.40

CHROME ISLAND 49 28 20 N 124 40 57 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	57.7	29.0	49.3	28.8	45.4	27.6
2	57.2	29.5	49.3	29.3	46.2	27.7
3	50.0	28.9	49.6	29.0	46.6	27.8
4	52.0	29.0	50.2	28.2	44.5	24.3
5	51.0	31.0	48.8	21.4	45.7	28.2
6	50.2	31.1	49.3	28.9	46.0	27.7
7	50.0	31.0	49.0	29.0	46.1	29.0
8	49.8	31.0	48.8	29.3	46.7	28.4
9	49.8	31.0	48.3	28.8	46.5	27.8
10	49.0	30.8	48.5	29.0	43.8	28.1
11	51.4	30.2	47.7	28.8	42.3	26.8
12	51.0	30.3	48.4	28.6	42.0	26.9
13	53.6	29.7	48.8	28.9	43.2	27.6
14	52.2	28.8	48.8	28.2	44.3	27.3
15	51.8	29.9	48.0	27.3	43.7	27.7
16	50.7	30.3	48.0	28.6	43.7	28.5
17	50.8	30.4	46.4	25.4	43.6	27.4
18	50.4	30.6	46.9	29.1	43.5	28.0
19	50.7	30.4	46.7	27.1	43.4	28.4
20	49.4	30.0	46.5	27.3	43.0	27.6
21	50.6	26.1	46.3	28.1	43.7	27.7
22	50.5	28.0	47.2	28.4	44.3	28.5
23	50.0	27.7	47.7	28.5	45.2	29.3
24	50.4	29.4	47.3	28.2	46.0	28.5
25	50.2	29.4	47.3	28.4	46.1	29.4
26	49.9	29.8	47.2	28.2	46.7	29.0
27	49.7	29.4	46.8	28.4	45.5	29.0
28	49.8	30.4	46.5	28.9	46.1	28.6
29	49.2	28.9	45.0	29.5	46.7	28.8
30	49.4	29.4	45.2	27.6	43.3	19.6
31	49.2	29.3	0.0	0.0	44.0	26.3
MEANS	51.1	29.7	47.8	28.2	44.8	27.7
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS..					51.3	28.8
MAXIMUM	57.7	31.1	50.2	29.5	46.7	29.4
MINIMUM	49.2	26.1	45.0	21.4	42.0	19.6
STD.DEV.	2.20	1.12	1.30	1.52	1.43	1.80

DEPARTURE BAY 49 12 38 N 123 57 17 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL
						1975
1	* 44.0	* 28.6	* 40.4	* 27.0	* 42.6	* 28.3
2	45.0	28.2	* 40.3	* 27.2	* 42.4	* 27.5
3	44.3	29.3	40.2	27.4	42.1	26.7
4	* 43.6	* 29.1	40.8	29.4	44.3	28.6
5	* 42.9	* 28.9	41.1	29.1	45.0	29.5
6	42.1	28.6	41.0	28.6	44.6	29.8
7	39.6	27.8	38.3	26.7	43.2	28.4
8	37.2	28.6	* 38.8	* 27.5	45.0	29.7
9	41.0	28.0	* 39.4	* 28.4	44.8	29.3
10	40.0	28.4	40.0	29.3	* 44.6	* 29.1
11	* 42.1	* 28.5	40.6	29.3	* 44.9	* 28.9
12	* 43.4	* 28.6	37.3	28.0	45.0	28.6
13	44.8	28.8	40.7	28.5	44.8	28.4
14	44.3	29.5	41.0	29.7	45.2	28.8
15	42.0	28.6	* 41.0	* 29.2	* 44.8	* 28.9
16	42.2	28.4	* 41.0	* 28.7	* 44.4	* 29.1
17	43.0	28.6	41.0	28.1	44.0	29.3
18	* 43.3	* 28.6	42.2	27.1	45.5	28.4
19	* 43.7	* 28.7	43.1	27.4	44.2	28.8
20	44.1	28.8	42.5	29.5	45.5	28.6
21	42.0	28.5	42.0	29.5	46.3	28.4
22	42.0	27.7	* 42.4	* 29.5	* 45.2	* 28.5
23	44.3	27.1	* 42.8	* 29.4	* 46.1	* 28.7
24	44.2	28.6	43.2	29.4	46.0	28.9
25	* 43.3	* 28.4	44.4	29.5	45.5	28.9
26	* 42.4	* 28.1	43.7	28.4	47.1	28.9
27	41.5	27.8	43.1	28.8	46.2	29.4
28	42.4	28.6	42.8	29.0	* 0.0	* 0.0
29	41.9	29.1	0.0	0.0	* 0.0	* 0.0
30	41.1	27.1	0.0	0.0	* 0.0	* 0.0
31	40.4	26.8	0.0	0.0	44.3	29.8
MEANS	42.3	28.3	41.4	28.6	44.9	28.9
OBSVNS.	22	22	20	20	20	20
MAXIMUM	45.0	29.5	44.4	29.7	47.1	29.8
MINIMUM	37.2	26.8	37.3	26.7	42.1	26.7
STD.DEV.	1.91	.70	1.77	.91	1.12	.70

DEPARTURE BAY 49 12 38 N 123 57 17 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 44.7	* 29.9	49.0	29.5	* 60.0	* 27.4
2	45.1	30.0	49.0	29.3	62.0	26.4
3	44.3	28.4	* 49.4	* 29.5	53.2	25.0
4	45.2	27.2	* 49.8	* 29.7	58.0	27.1
5	* 46.1	* 27.7	50.3	29.9	56.5	29.0
6	* 47.0	* 28.3	50.0	29.0	58.0	28.8
7	48.0	28.9	51.2	29.1	* 59.3	* 27.6
8	48.0	30.0	53.0	29.5	* 60.6	* 26.4
9	49.3	29.7	55.5	29.0	62.0	25.1
10	50.1	29.4	* 55.1	* 29.0	60.5	26.1
11	51.6	28.8	* 54.7	* 29.1	58.3	26.1
12	* 50.4	* 29.1	54.2	29.1	58.2	27.4
13	* 49.2	* 29.5	54.0	26.1	58.0	26.7
14	48.0	29.9	53.3	27.8	* 57.8	* 27.0
15	46.0	29.4	53.3	28.8	* 57.6	* 27.3
16	49.5	27.7	53.2	25.5	57.3	27.7
17	49.2	29.5	* 0.0	* 0.0	60.5	25.1
18	47.8	29.1	* 0.0	* 0.0	64.0	28.0
19	* 47.8	* 29.0	* 0.0	* 0.0	63.0	28.2
20	* 47.9	* 28.8	56.0	27.7	61.1	27.2
21	46.0	28.6	53.4	27.3	* 0.0	* 0.0
22	46.5	27.8	52.6	26.8	* 0.0	* 0.0
23	47.3	27.8	55.0	29.9	* 0.0	* 0.0
24	47.2	27.8	* 54.4	* 29.9	60.2	19.6
25	46.5	30.0	* 53.7	* 30.0	51.3	22.1
26	* 46.6	* 30.1	53.0	30.0	54.0	26.9
27	* 46.8	* 30.2	53.1	29.8	54.0	27.4
28	47.0	30.3	54.4	30.0	* 56.4	* 25.0
29	46.6	29.9	55.5	29.5	* 58.8	* 22.5
30	48.4	30.0	56.0	29.4	61.2	20.0
31	0.0	0.0	* 56.0	* 28.4	0.0	0.0
MEANS	47.8	29.1	53.1	28.8	58.6	26.0
OBSVNS.	21	21	21	21	20	20
MAXIMUM	51.6	30.3	56.0	30.0	64.0	29.0
MINIMUM	44.3	27.2	49.0	25.5	51.3	19.6
STD.DEV.	1.72	.95	2.13	1.19	3.45	2.63

DEPARTURE BAY 49 12 38 N 123 57 17 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	* 61.8	* 20.4	65.5	24.3	* 0.0	* 0.0
2	* 62.4	* 20.8	* 0.0	* 0.0	61.0	21.4
3	63.0	21.3	* 0.0	* 0.0	* 62.0	23.3
4	67.0	26.1	* 0.0	* 0.0	63.0	22.4
5	* 68.4	* 25.4	64.5	23.0	61.5	22.5
6	* 69.6	* 24.6	65.7	18.8	* 0.0	* 0.0
7	71.3	23.8	63.2	22.5	* 0.0	* 0.0
8	69.4	24.2	55.5	26.8	* 0.0	* 0.0
9	66.0	26.8	* 57.1	* 26.1	59.7	26.1
10	69.1	25.6	* 58.7	* 25.4	64.4	26.4
11	63.0	25.9	60.3	24.6	65.5	27.7
12	* 62.4	* 25.8	63.7	20.5	64.4	26.1
13	* 61.7	* 25.7	65.5	22.5	* 64.5	* 26.6
14	61.0	25.6	66.4	21.7	* 64.7	* 27.1
15	62.3	26.8	64.6	22.9	64.9	27.7
16	63.2	25.0	* 63.2	* 24.2	65.1	27.7
17	61.0	24.7	* 61.8	* 25.5	65.1	27.8
18	61.4	26.4	60.3	26.8	62.6	27.3
19	* 62.9	* 23.4	62.5	26.8	63.5	27.2
20	* 64.4	* 20.4	61.0	26.4	* 62.0	* 27.1
21	66.0	17.4	58.0	27.3	* 60.5	* 27.0
22	65.3	17.9	59.5	23.3	59.0	26.9
23	64.4	19.2	* 58.7	* 23.8	59.5	27.2
24	65.0	21.7	* 57.9	* 24.3	58.5	29.7
25	63.5	23.9	57.0	24.8	57.2	28.9
26	* 63.7	* 22.4	58.5	24.2	58.6	28.8
27	* 64.0	* 20.8	56.9	25.6	* 60.0	* 28.9
28	64.3	19.2	55.8	26.0	* 61.4	* 29.1
29	64.4	22.5	55.8	27.6	62.8	29.3
30	65.0	24.8	* 0.0	* 0.0	64.4	28.5
31	66.2	23.0	* 0.0	* 0.0	0.0	0.0
MEANS	64.6	23.4	61.0	24.3	62.1	26.6
OBSVNS.	21	21	20	20	19	20
MAXIMUM	71.3	26.8	66.4	27.6	65.5	29.7
MINIMUM	61.0	17.4	55.5	18.8	57.2	21.4
STD.DEV.	2.74	2.94	3.75	2.41	2.68	2.40

DEPARTURE BAY 49 12 38 N 123 57 17 W

	OCTOBER		NOVEMBER		DECEMBER	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	64.8	27.2	* 51.8	* 21.0	* 0.0	* 0.0
2	61.3	27.1	* 51.8	* 20.4	48.2	26.9
3	57.2	27.4	51.8	19.7	47.5	28.0
4	* 55.1	* 27.9	52.7	20.5	41.7	26.5
5	* 53.0	* 28.4	50.0	25.4	39.2	26.0
6	50.9	29.0	50.0	19.2	* 41.0	* 25.3
7	50.5	28.9	48.2	19.7	* 42.8	* 24.5
8	50.0	29.3	* 48.2	* 22.6	44.6	23.7
9	46.4	26.3	* 48.2	* 25.6	44.6	25.8
10	50.0	25.9	48.2	28.6	41.9	25.4
11	* 0.0	* 0.0	* 49.6	* 26.9	41.9	25.4
12	* 0.0	* 0.0	51.1	25.1	41.0	25.1
13	* 0.0	* 0.0	50.5	21.0	* 42.2	* 25.8
14	* 0.0	* 0.0	50.0	16.3	* 43.4	* 26.5
15	* 0.0	* 0.0	* 50.1	* 19.1	44.6	27.2
16	51.8	26.9	* 50.2	* 21.9	41.5	27.7
17	51.6	20.9	50.4	24.7	44.6	27.8
18	* 50.6	* 22.7	50.0	24.4	41.9	27.1
19	* 49.4	* 24.6	42.8	26.3	41.0	26.9
20	48.2	26.5	44.6	22.1	* 41.7	* 26.9
21	50.4	28.2	43.2	23.4	* 42.5	* 25.8
22	46.4	26.1	* 44.8	* 24.7	43.3	26.6
23	46.7	22.5	* 46.5	* 26.0	44.6	25.9
24	48.2	24.4	48.2	27.3	45.3	26.4
25	* 0.0	* 0.0	44.6	25.6	* 0.0	* 0.0
26	* 0.0	* 0.0	46.9	27.3	* 0.0	* 0.0
27	* 0.0	* 0.0	51.8	27.7	* 0.0	* 0.0
28	50.7	23.4	47.7	25.8	* 0.0	* 0.0
29	51.1	20.8	* 0.0	* 0.0	47.6	21.8
30	52.0	27.8	* 0.0	* 0.0	* 49.3	27.8
31	51.6	21.6	0.0	0.0	* 46.6	* 27.1
MEANS	51.7	25.8	48.6	23.7	43.6	26.2
OBSVNS.	19	19	19	19	18	19
YRLY.MEANS................................					51.7	26.7
MAXIMUM	64.8	29.3	52.7	28.6	48.2	28.0
MINIMUM	46.4	20.8	42.8	16.3	39.2	21.8
STD.DEV.	4.66	2.74	2.96	3.45	2.57	1.53

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	29.5	45.5	29.9	44.4	29.3
2	45.5	29.1	44.5	29.5	44.6	29.4
3	45.8	29.4	44.0	29.1	44.7	29.0
4	45.3	29.0	42.3	28.4	43.9	28.4
5	45.2	28.9	41.2	28.1	43.8	28.6
6	45.0	28.4	41.8	28.1	43.8	27.1
7	43.6	27.7	41.7	28.4	42.5	28.8
8	44.6	28.6	41.8	28.8	43.6	28.4
9	43.6	28.8	41.0	28.6	43.3	27.7
10	43.3	28.6	42.9	29.3	43.3	28.0
11	42.2	28.4	43.1	29.0	43.7	28.5
12	43.5	28.6	* 42.9	* 29.1	43.8	28.6
13	43.6	28.5	42.7	29.3	43.6	29.3
14	42.7	28.4	42.3	28.8	43.7	27.7
15	42.6	28.8	43.0	29.0	44.6	29.4
16	42.7	28.6	44.4	29.4	44.4	29.5
17	43.5	28.6	43.3	28.9	45.0	29.5
18	43.3	28.5	43.8	29.3	45.7	29.7
19	43.1	27.4	44.7	29.3	45.6	29.8
20	43.0	28.6	44.1	29.4	45.3	29.7
21	43.3	28.5	42.8	29.1	* 45.6	* 29.8
22	42.7	26.8	43.2	29.3	46.0	29.9
23	44.4	28.9	43.7	29.1	45.8	29.9
24	44.0	29.1	44.0	29.1	43.9	28.8
25	44.3	28.6	42.5	28.6	43.8	28.6
26	43.3	28.6	43.1	27.4	44.5	28.9
27	43.2	28.6	43.5	29.1	43.8	28.5
28	43.2	28.9	44.5	29.0	44.5	28.9
29	42.6	28.5	0.0	0.0	45.6	28.8
30	* 43.5	* 28.9	0.0	0.0	44.6	28.0
31	* 44.5	* 29.4	0.0	0.0	44.3	29.0
MEANS	43.6	28.6	43.2	28.9	44.3	28.9
OBSVNS.	29	29	27	27	30	30
MAXIMUM	45.8	29.5	45.5	29.9	46.0	29.9
MINIMUM	42.2	26.8	41.0	27.4	42.5	27.1
STD.DEV.	1.03	.54	1.12	.52	.83	.70

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

	APRIL		MAY		JUNE	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.3	28.8	48.1	29.4	61.0	26.8
2	45.0	29.1	48.6	29.4	59.8	27.1
3	* 45.2	* 29.2	47.0	29.7	58.6	26.9
4	45.5	29.3	47.8	29.7	52.6	28.4
5	46.0	29.1	50.0	29.3	57.6	26.4
6	46.4	29.3	48.3	28.9	50.1	28.8
7	45.2	29.1	47.6	29.1	55.5	24.4
8	45.4	29.3	48.3	29.5	56.3	25.1
9	45.7	29.3	52.3	28.1	56.2	26.4
10	45.7	29.4	55.1	26.7	58.8	24.8
11	46.0	29.5	53.5	23.8	56.7	26.4
12	46.7	29.5	51.6	27.6	56.8	26.9
13	46.5	29.5	52.4	28.1	57.8	26.7
14	46.6	29.0	54.8	28.0	57.5	26.7
15	47.4	29.0	54.5	28.2	56.7	27.2
16	47.2	29.1	52.3	28.0	56.8	27.2
17	47.3	29.1	50.6	28.5	58.4	25.2
18	47.6	29.1	49.3	29.3	60.6	25.1
19	46.8	29.1	53.2	26.9	64.8	25.2
20	47.2	28.9	52.9	28.4	56.5	27.6
21	46.2	29.3	52.6	26.1	56.9	26.0
22	47.4	29.7	52.8	28.2	51.6	26.8
23	46.6	29.7	52.0	28.1	52.5	28.8
24	46.2	29.7	51.0	28.1	52.3	23.5
25	45.8	29.7	52.0	27.4	53.3	28.1
26	46.2	29.7	53.5	28.1	53.7	28.1
27	45.8	29.7	52.8	28.1	56.6	26.1
28	46.2	29.1	52.0	28.4	* 57.6	* 23.0
29	47.2	29.3	52.4	28.8	58.7	19.9
30	47.2	29.3	* 53.9	* 28.9	59.6	19.9
31	0.0	0.0	55.5	29.1	0.0	0.0
MEANS	46.4	29.3	51.5	28.3	56.7	26.2
OBSVNS.	29	29	30	30	29	29
MAXIMUM	48.2	29.7	55.5	29.7	64.8	28.8
MINIMUM	44.3	28.8	47.0	23.8	50.1	19.9
STD.DEV.	.69	.27	2.40	1.15	3.17	2.24

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1975 TEMP	SEPTEMBER 1975 SAL
1	61.0	20.3	63.3	24.0	59.2	19.6
2	61.2	22.4	62.8	24.4	59.5	21.3
3	59.0	24.6	62.0	24.6	57.9	23.7
4	63.9	23.3	60.5	25.0	58.6	22.2
5	66.4	21.7	59.9	25.6	56.9	22.6
6	68.0	22.9	63.3	19.7	59.5	23.1
7	64.3	23.9	62.0	20.9	60.5	23.6
8	66.1	23.8	56.8	25.6	58.3	24.7
9	64.2	25.0	58.2	25.5	58.3	25.4
10	64.5	24.2	60.5	23.9	58.4	25.5
11	60.3	26.5	60.3	21.8	59.0	25.9
12	57.5	28.0	62.6	20.5	59.0	25.8
13	56.8	28.2	63.2	22.0	60.7	25.4
14	60.7	26.4	64.3	21.8	61.4	25.5
15	62.4	25.9	63.0	23.1	61.0	28.9
16	62.0	25.9	53.3	25.5	59.5	26.0
17	57.9	26.9	58.0	26.9	56.5	28.6
18	58.2	27.1	57.4	26.9	57.0	28.1
19	59.4	26.5	58.3	26.1	57.3	28.1
20	63.5	20.5	57.5	27.1	57.6	26.5
21	62.0	17.9	57.7	28.6	57.9	26.8
22	62.5	20.8	58.8	25.8	58.8	28.2
23	64.2	19.0	56.4	27.4	58.9	28.1
24	65.8	20.8	59.7	24.6	56.7	27.4
25	63.8	22.4	58.5	26.8	56.6	26.9
26	67.1	16.2	58.0	25.8	57.6	26.9
27	68.8	15.2	54.8	26.0	59.0	26.5
28	63.4	20.5	52.5	28.2	58.2	27.2
29	64.0	22.1	51.6	28.8	58.8	27.2
30	62.8	23.7	51.7	28.5	58.9	26.9
31	63.2	23.5	56.2	28.7	0.0	0.0
MEANS	62.7	23.1	59.0	25.2	58.6	25.8
OBSVNS.	31	31	31	31	30	30
MAXIMUM	68.8	28.2	64.3	28.8	61.4	28.9
MINIMUM	56.8	15.2	51.7	19.7	56.5	19.6
STD.DEV.	3.[illegible]6	3.31	3.37	2.56	1.24	2.34

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	58.3	27.1	49.2	28.1	45.0	26.9
2	58.5	26.9	48.5	23.1	44.2	25.6
3	54.6	26.2	49.8	28.8	45.8	26.7
4	50.1	28.8	49.3	29.0	45.5	26.1
5	50.3	28.5	49.3	29.1	43.3	24.2
6	49.0	28.0	48.7	28.6	45.7	26.9
7	49.0	28.5	48.6	28.5	45.5	27.1
8	49.6	29.0	48.3	27.7	46.5	27.6
9	49.3	29.0	47.5	26.0	46.0	26.4
10	49.5	26.9	46.7	23.8	43.8	25.6
11	53.2	25.4	48.3	26.9	43.5	25.4
12	53.0	25.5	48.6	28.8	42.4	25.2
13	54.4	25.9	48.4	29.4	43.8	26.0
14	51.6	26.0	48.5	29.4	* 44.1	* 26.4
15	50.5	27.8	48.4	28.9	44.5	26.9
16	50.7	28.1	47.3	27.4	43.7	26.5
17	49.7	28.8	46.5	25.2	42.4	26.0
18	49.4	27.6	46.2	25.4	41.5	25.4
19	49.2	29.4	42.9	18.8	41.7	25.1
20	49.5	28.6	42.6	20.3	40.8	24.8
21	49.0	26.7	43.7	22.9	41.7	25.0
22	49.8	26.0	46.5	26.9	43.6	26.3
23	50.0	23.5	47.1	27.3	45.7	27.6
24	49.1	23.4	47.3	27.3	47.0	28.4
25	49.8	28.8	45.0	24.3	45.6	27.2
26	49.5	28.5	46.5	26.9	47.2	28.5
27	48.0	29.3	45.7	26.3	42.0	17.0
28	49.0	29.3	44.4	24.7	46.7	28.2
29	48.7	29.4	44.3	25.5	47.4	29.1
30	49.2	27.7	46.4	27.3	44.6	26.0
31	49.1	28.1	0.0	0.0	43.8	25.8
MEANS	50.7	27.7	47.0	26.4	44.4	26.1
OBSVNS.	31	31	30	30	30	30
YRLY.MEANS....................................					50.8	27.0
MAXIMUM	56.5	29.4	49.8	29.4	47.4	29.1
MINIMUM	48.0	23.4	42.6	18.8	40.8	17.0
STD.DEV.	2.59	1.62	1.97	2.65	1.85	2.09

ACTIVE PASS 48 52 26 N 123 17 23 W

	JANUARY		FEBRUARY		MARCH	1975
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.2	29.7	44.0	28.4	43.3	28.0
2	45.0	29.7	44.2	30.2	43.7	28.4
3	45.2	30.0	43.3	29.8	43.3	30.3
4	45.4	29.7	43.6	29.6	43.1	28.4
5	45.3	29.0	41.0	27.8	42.7	26.9
6	43.9	28.4	42.2	28.6	43.2	27.7
7	43.2	27.4	40.6	27.7	42.9	27.7
8	44.2	29.0	42.3	29.3	44.2	28.8
9	42.7	26.7	41.0	27.6	45.2	27.7
10	42.5	26.7	41.5	27.7	44.1	24.8
11	41.9	28.1	40.6	27.7	44.7	28.6
12	42.9	28.0	42.2	28.9	44.5	28.5
13	43.9	29.3	43.0	28.9	44.2	28.1
14	43.7	29.0	42.8	28.9	43.8	28.6
15	44.0	29.0	42.0	29.0	44.0	29.4
16	41.2	26.1	42.8	29.1	44.5	28.9
17	43.7	28.5	43.0	29.3	44.4	29.0
18	42.6	28.1	43.2	29.5	44.2	30.3
19	43.2	28.1	43.2	29.3	43.8	29.8
20	43.1	28.6	* 42.6	* 28.3	44.6	29.5
21	42.8	29.0	41.9	27.2	44.1	29.8
22	42.2	27.1	42.7	28.4	44.7	30.3
23	44.1	29.3	43.8	29.0	46.1	29.9
24	43.8	28.6	43.2	28.4	* 46.1	* 29.5
25	* 43.0	* 28.2	43.3	28.1	* 46.2	* 29.1
26	42.2	27.8	44.0	29.0	46.2	28.6
27	42.6	28.4	43.6	28.5	45.7	29.1
28	42.1	28.2	43.2	28.8	45.0	28.6
29	41.7	28.8	0.0	0.0	46.2	29.3
30	41.9	28.9	0.0	0.0	* 45.0	* 29.5
31	43.2	30.2	0.0	0.0	43.8	29.7
MEANS	43.3	28.5	42.7	28.7	44.3	28.7
OBSVNS.	30	30	27	27	28	28
MAXIMUM	45.4	30.2	44.2	30.2	46.2	30.3
MINIMUM	41.2	26.1	40.6	27.2	42.7	24.8
STD.DEV.	1.16	1.00	1.04	.76	.99	1.22

ACTIVE PASS 48 52 26 N 123 17 23 W

DATE	APRIL TEMP	APRIL SAL	MAY TEMP	MAY SAL	JUNE 1975 TEMP	JUNE 1975 SAL
1	43.8	29.5	48.3	28.9	54.6	24.4
2	44.7	29.7	47.3	29.5	52.8	25.9
3	44.4	29.7	47.5	29.8	54.2	20.4
4	45.7	29.9	47.7	30.2	50.5	28.6
5	46.4	30.2	49.2	29.3	52.8	29.4
6	46.6	29.8	48.7	29.8	58.0	17.1
7	47.7	28.8	49.5	30.2	59.2	13.1
8	48.8	27.6	52.2	28.8	52.7	24.6
9	47.7	29.7	51.7	27.1	56.7	21.3
10	48.2	29.9	51.7	25.8	54.8	26.5
11	48.7	28.9	51.3	28.4	57.7	24.7
12	48.3	29.1	49.0	30.4	57.3	23.3
13	47.2	28.0	53.9	20.4	57.0	25.4
14	47.3	28.4	49.2	28.8	53.3	28.0
15	46.7	28.6	49.3	28.8	52.5	27.8
16	46.0	29.7	49.2	29.5	54.2	27.2
17	46.8	29.3	49.6	29.1	56.8	10.8
18	47.0	29.5	50.2	29.0	53.6	27.8
19	47.2	29.3	51.0	16.3	57.1	28.0
20	47.8	28.4	53.1	25.6	53.0	29.4
21	49.0	29.7	51.7	28.1	51.7	29.9
22	47.8	29.4	50.2	28.6	50.2	30.4
23	48.2	29.5	53.5	22.0	52.7	29.8
24	47.9	30.0	52.2	28.6	52.3	26.7
25	46.8	29.7	53.1	29.4	51.0	28.6
26	47.7	29.7	51.2	28.5	51.2	29.5
27	48.8	28.4	51.5	29.1	51.7	29.1
28	47.2	29.8	51.7	29.1	51.7	27.6
29	47.4	29.8	52.2	29.4	55.7	20.1
30	47.7	29.4	52.6	28.4	60.4	10.5
31	0.0	0.0	56.7	20.9	0.0	0.0
MEANS	47.1	29.3	50.8	27.7	54.2	24.9
OBSVNS.	30	30	31	31	30	30
MAXIMUM	49.0	30.2	56.7	30.4	60.4	30.4
MINIMUM	43.8	27.6	47.3	16.3	50.2	10.5
STD.DEV.	1.23	.64	2.13	3.32	2.73	5.59

ACTIVE PASS 48 52 26 N 123 17 23 W

	JULY		AUGUST		SEPTEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.3	22.5	61.2	26.0	60.2	13.5
2	58.3	25.5	60.5	25.8	54.5	27.4
3	59.5	26.5	60.0	27.1	58.7	15.4
4	66.3	14.1	57.9	27.7	61.6	17.8
5	66.1	11.1	56.2	28.9	61.3	16.6
6	55.7	27.6	57.0	27.2	59.6	24.0
7	* 59.0	* 26.2	52.5	29.5	55.7	27.3
8	62.3	24.7	53.8	29.4	56.9	20.6
9	58.7	26.8	54.8	28.8	58.0	25.6
10	53.6	29.3	55.8	26.9	58.3	25.4
11	53.7	26.9	60.8	19.0	58.7	25.1
12	54.8	26.9	62.0	17.9	58.7	25.0
13	55.2	30.0	62.0	22.4	59.0	23.7
14	53.4	29.4	62.8	24.2	60.4	25.5
15	55.2	26.5	62.8	23.8	58.6	25.1
16	54.2	29.3	54.6	27.6	55.2	28.6
17	53.3	29.4	55.5	28.1	58.2	22.1
18	53.7	29.7	59.5	22.7	57.8	22.5
19	54.2	29.7	58.3	26.7	59.2	25.5
20	63.5	14.4	55.8	28.9	56.3	28.2
21	65.6	11.9	55.9	28.8	56.6	27.6
22	62.6	21.4	55.3	24.3	56.7	26.3
23	66.0	16.3	58.0	28.0	* 55.2	* 27.4
24	63.6	19.4	54.9	27.2	53.7	28.5
25	67.3	10.6	54.9	27.2	56.0	24.8
26	66.2	12.9	52.8	28.5	58.1	25.5
27	* 66.2	* 16.6	53.0	28.2	55.9	23.5
28	66.1	20.3	52.3	28.2	59.0	19.5
29	* 64.1	* 22.3	52.2	29.0	58.8	23.7
30	62.0	24.3	52.4	28.2	57.8	23.5
31	61.9	23.9	58.1	19.9	0.0	0.0
MEANS	59.7	23.1	56.9	26.1	58.0	23.7
OBSVNS.	28	28	31	31	29	29
MAXIMUM	67.3	30.0	62.8	29.5	61.6	28.6
MINIMUM	53.3	10.6	52.2	17.9	53.7	13.5
STD.DEV.	5.06	6.67	3.37	3.29	1.92	3.91

ACTIVE PASS 48 52 26 N 123 17 23 W

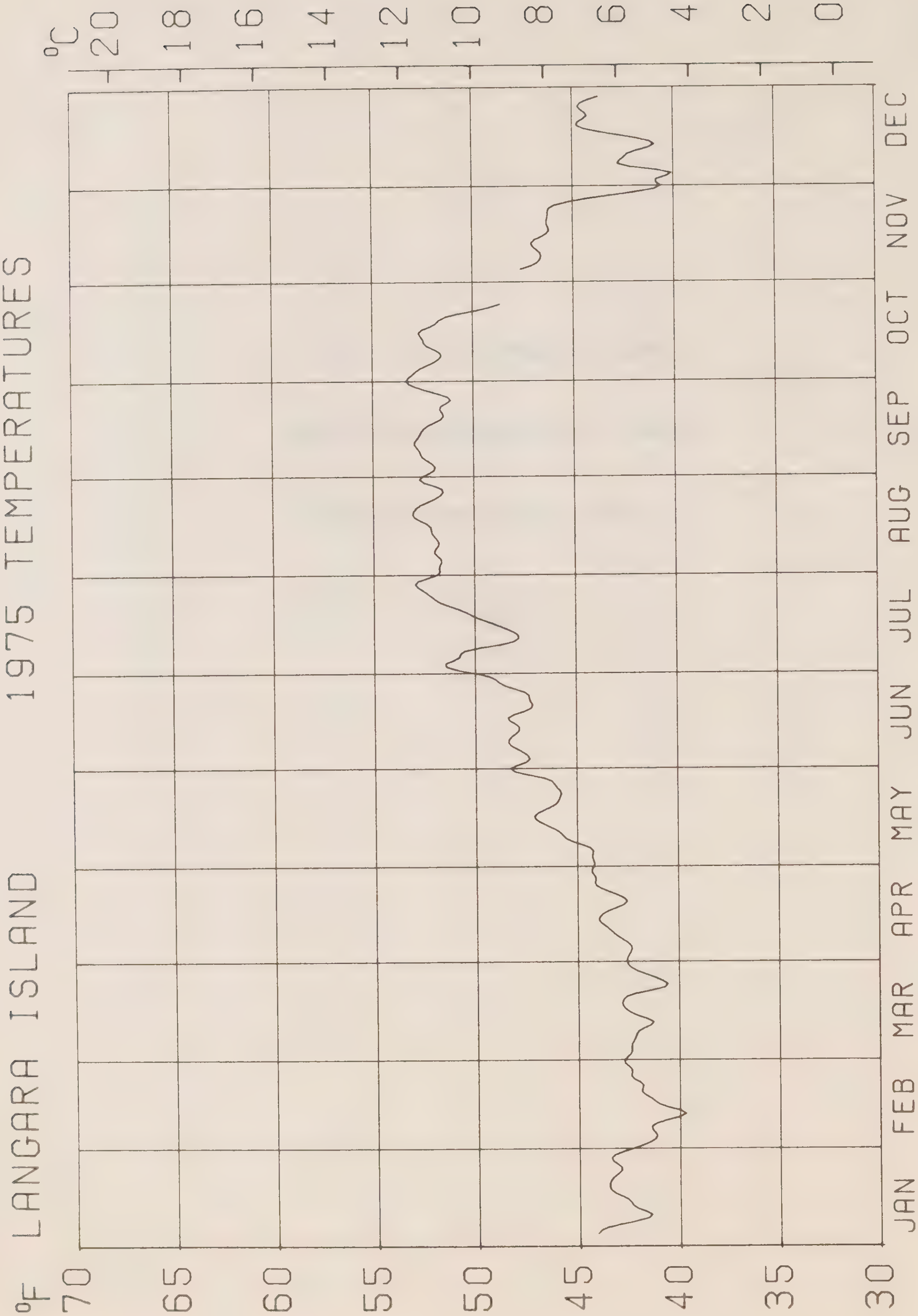
DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1975 TEMP	DECEMBER 1975 SAL
1	56.7	28.0	49.1	30.0	45.7	27.2
2	54.2	29.1	48.9	29.4	46.5	28.1
3	52.4	29.1	49.5	30.0	46.8	28.4
4	51.6	30.3	50.0	30.4	45.6	27.8
5	51.1	30.0	49.2	29.7	45.0	28.4
6	51.8	29.8	48.7	28.9	44.2	26.4
7	49.2	29.9	48.2	29.8	45.2	26.9
8	50.0	30.2	48.2	29.8	46.6	28.0
9	49.9	30.4	47.3	28.9	46.1	26.4
10	49.7	30.0	45.6	17.3	42.3	21.6
11	51.2	25.4	47.7	27.7	43.1	21.2
12	52.0	25.6	48.3	29.0	47.3	28.3
13	52.4	26.8	48.2	30.0	43.6	26.4
14	51.4	27.2	49.1	30.2	44.3	26.4
15	52.5	28.0	48.2	29.9	44.0	26.7
16	49.7	29.7	47.8	30.2	42.5	24.8
17	49.8	30.2	47.1	28.5	42.5	24.8
18	49.6	29.4	46.2	26.3	41.2	22.4
19	50.2	29.3	44.5	20.4	41.8	23.1
20	49.0	29.3	42.4	19.5	42.7	27.3
21	48.5	29.7	44.0	21.2	43.1	25.1
22	49.3	20.8	46.8	27.4	44.2	27.7
23	48.2	25.2	47.2	28.8	45.0	28.1
24	48.8	26.4	47.3	28.6	46.0	28.4
25	49.1	29.7	45.5	24.4	45.7	28.8
26	48.7	29.5	* 44.9	* 23.3	46.3	29.3
27	48.8	29.9	44.2	22.1	45.7	29.4
28	48.6	30.0	44.2	24.6	46.0	29.1
29	48.9	30.2	45.1	27.4	46.7	29.7
30	48.7	30.4	45.0	27.4	* 45.0	* 26.7
31	49.1	30.0	0.0	0.0	43.2	23.7
MEANS	50.4	28.7	47.0	27.2	44.6	26.6
OBSVNS.	31	31	29	29	30	30
YRLY.MEANS...					50.0	26.9
MAXIMUM	56.7	30.4	50.0	30.4	47.3	29.7
MINIMUM	48.2	20.8	42.4	17.3	41.2	21.2
STD.DEV.	1.90	2.15	1.97	3.68	1.71	2.33

Annual Graphs of the 7-day

Normally-weighted Running Means

for Temperature and Salinity

1975


LANGARA ISLAND 1975 TEMPERATURES
°F
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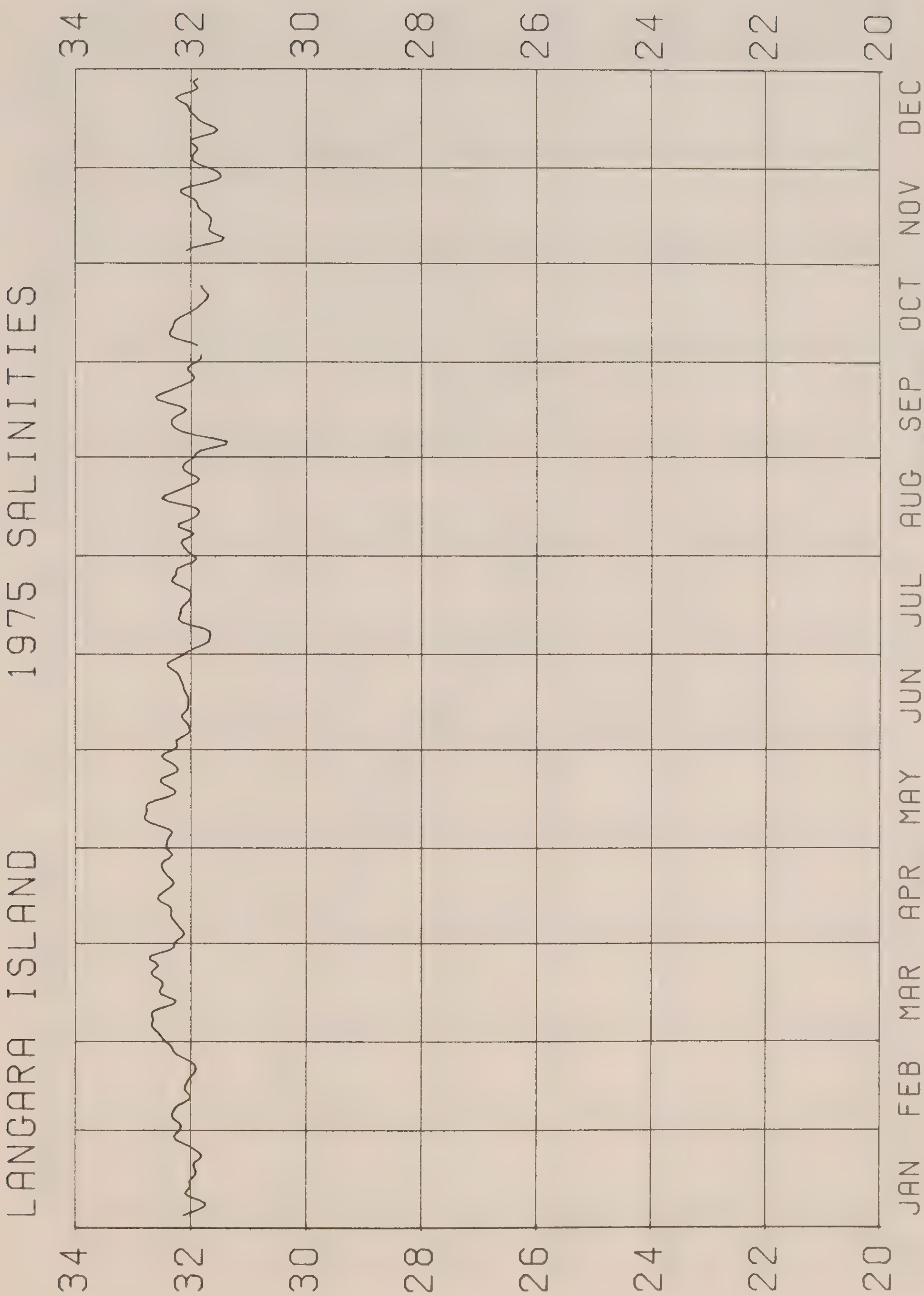
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


LANGARA ISLAND 1975 SALINITIES
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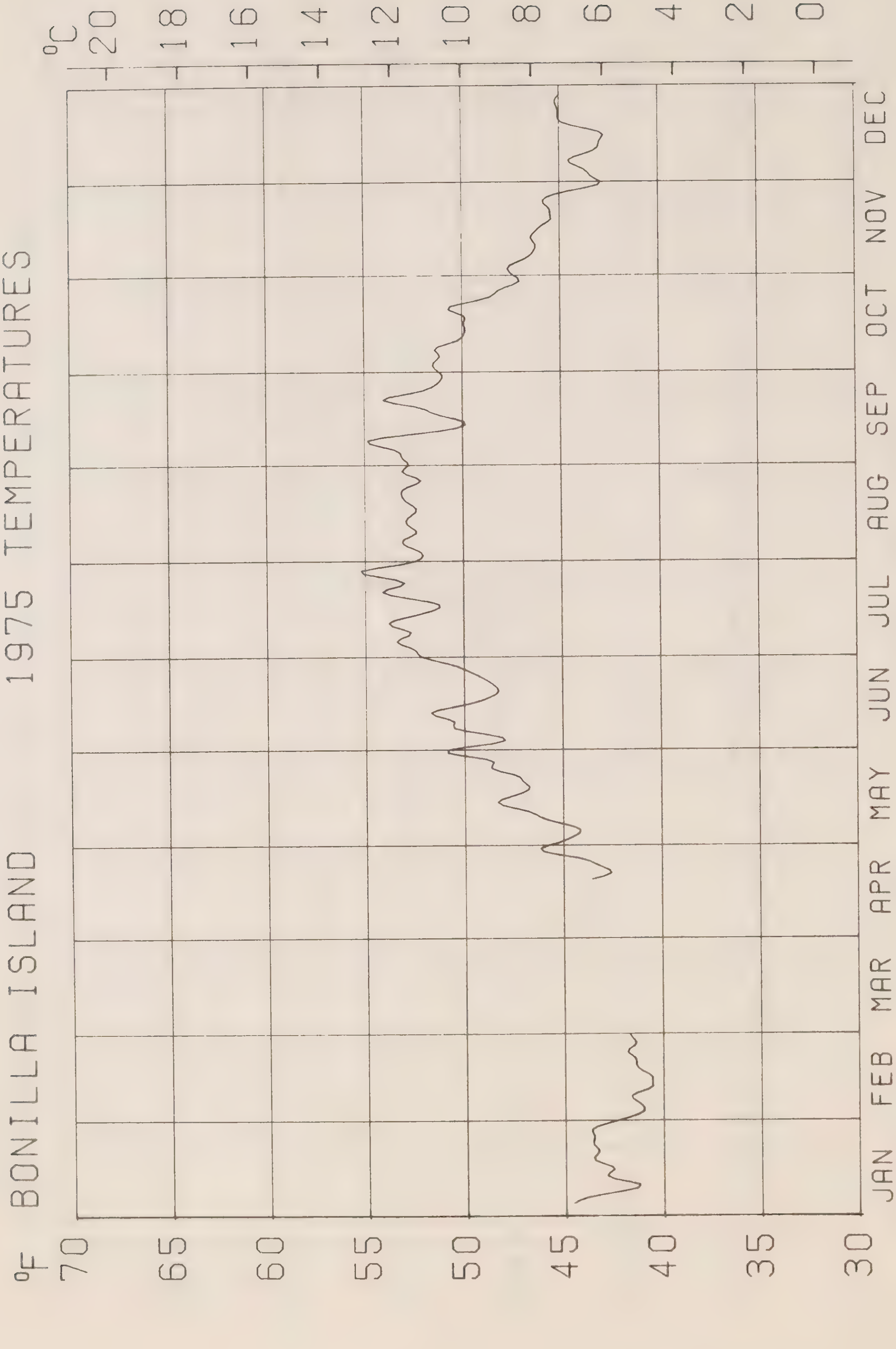
BONILLA ISLAND 1975 TEMPERATURES
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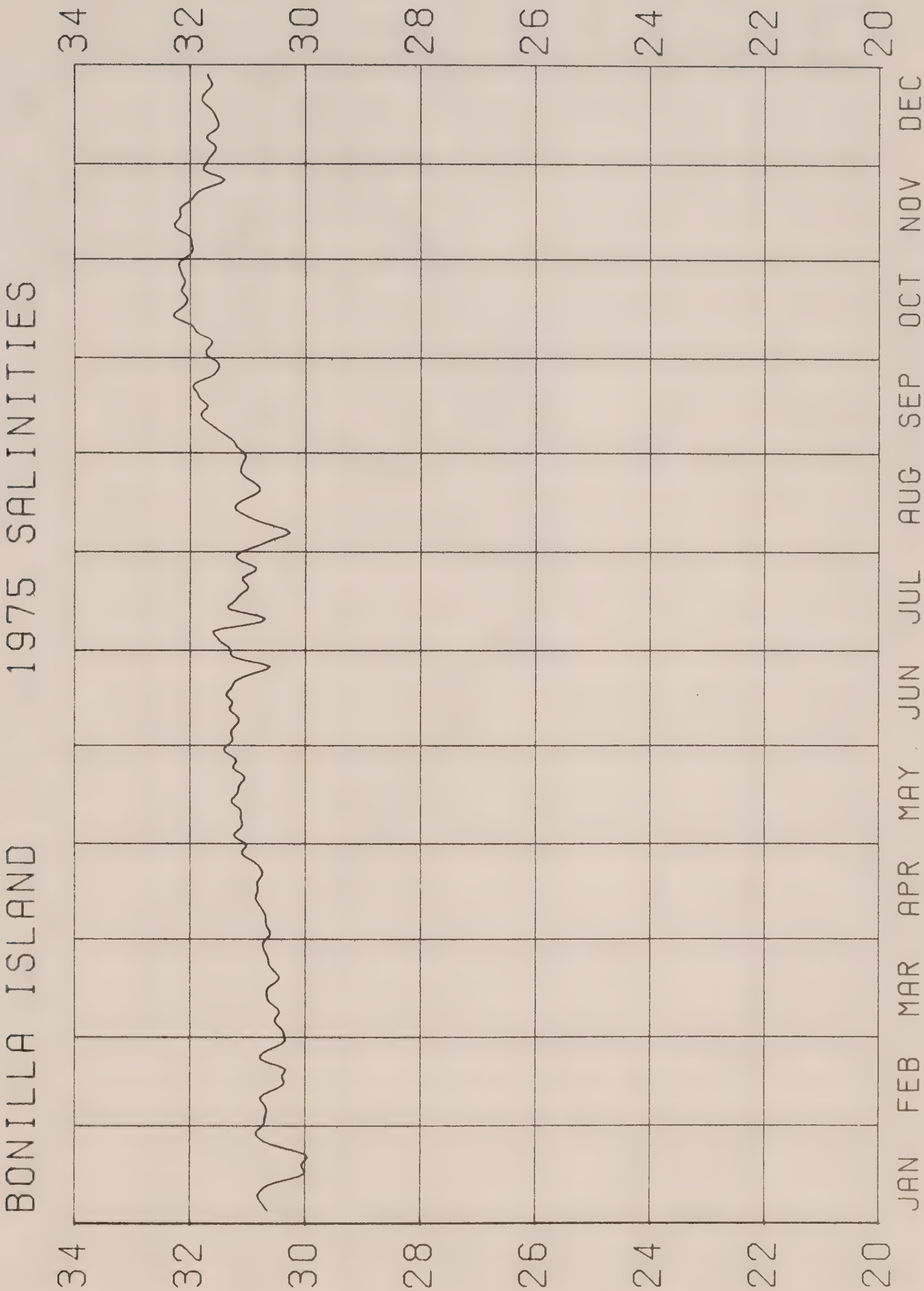

BONILLA ISLAND 1975 SALINITIES
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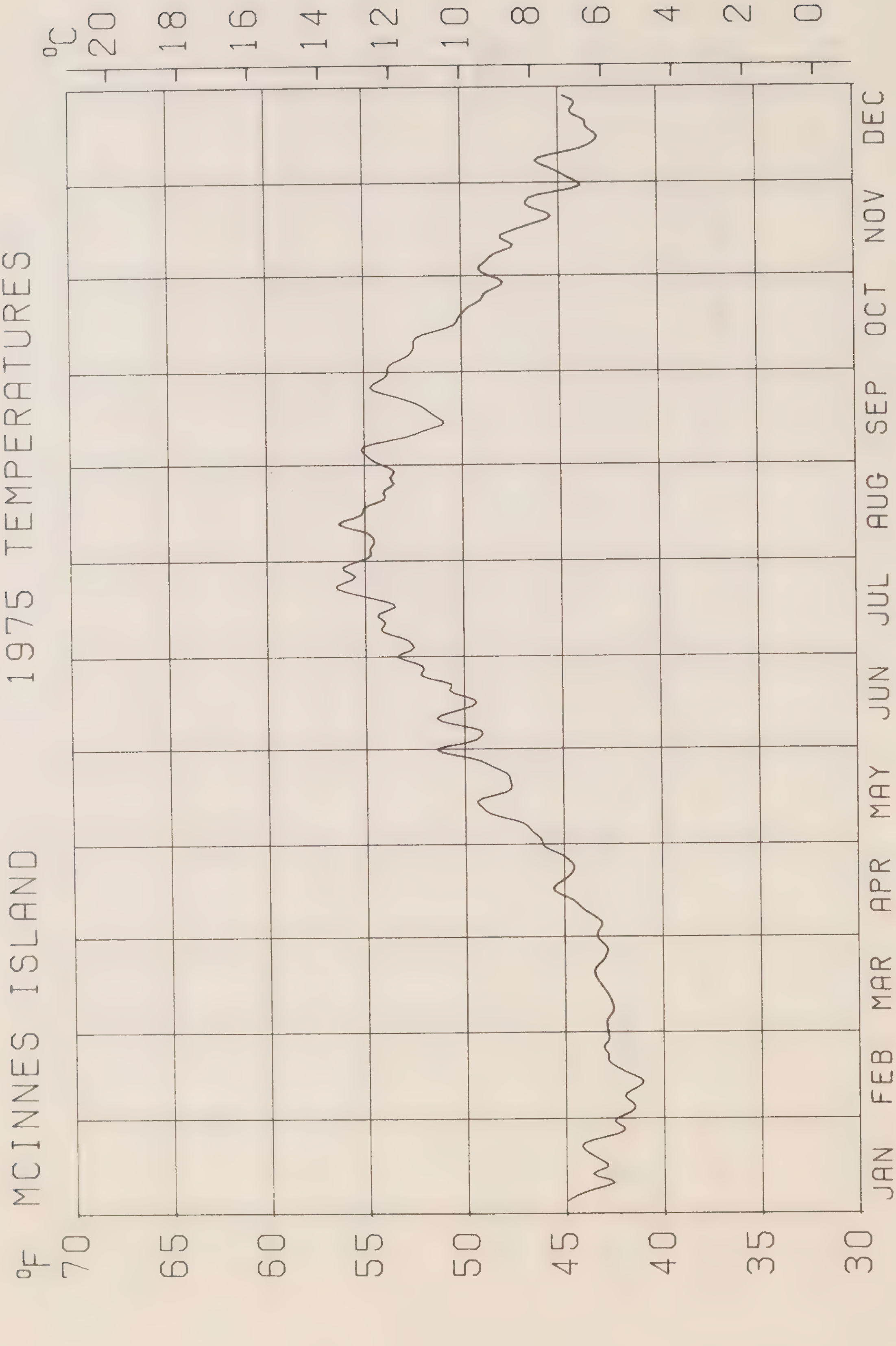
MCINNES ISLAND 1975 TEMPERATURES
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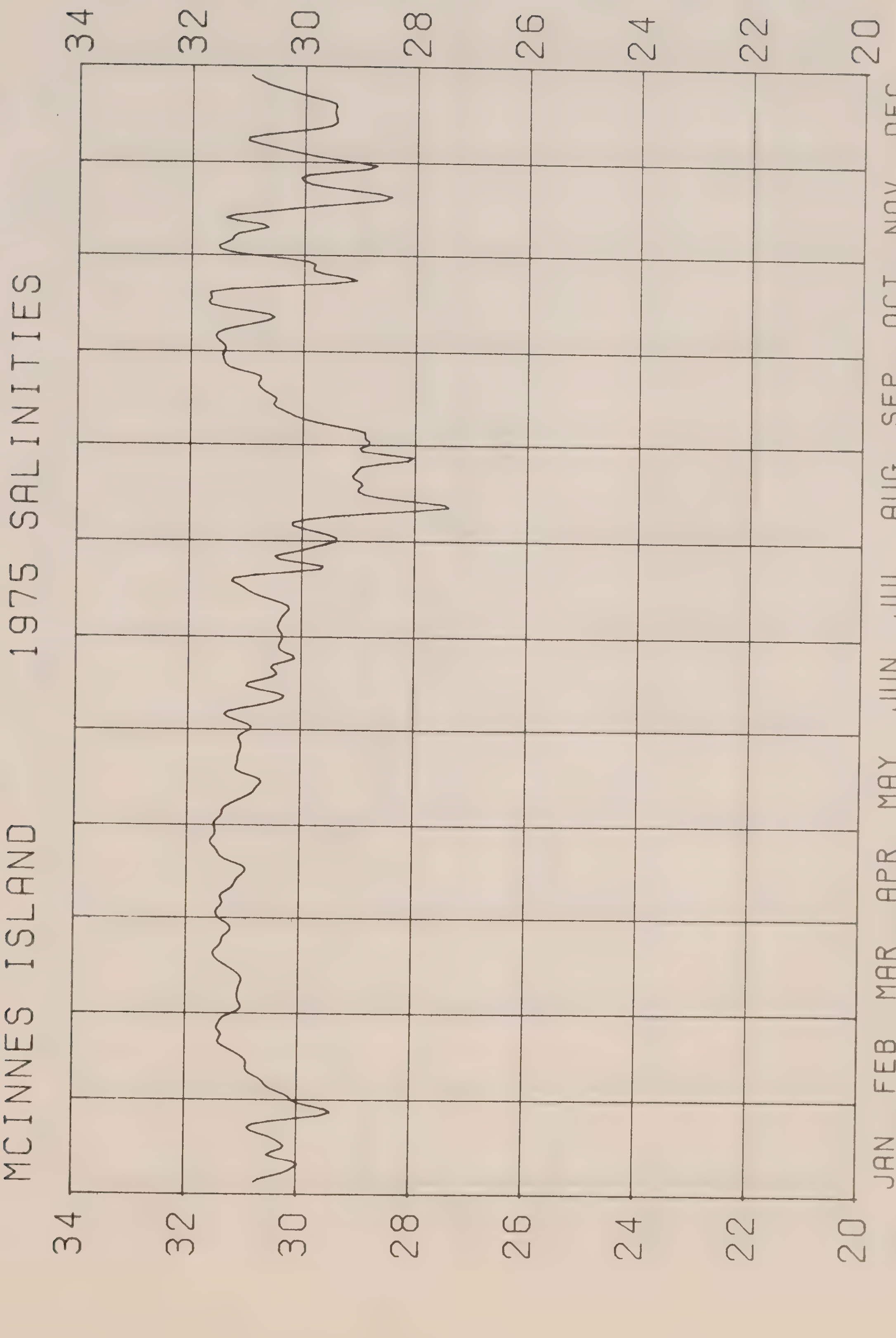
MCINNES ISLAND 1975 SALINITIES
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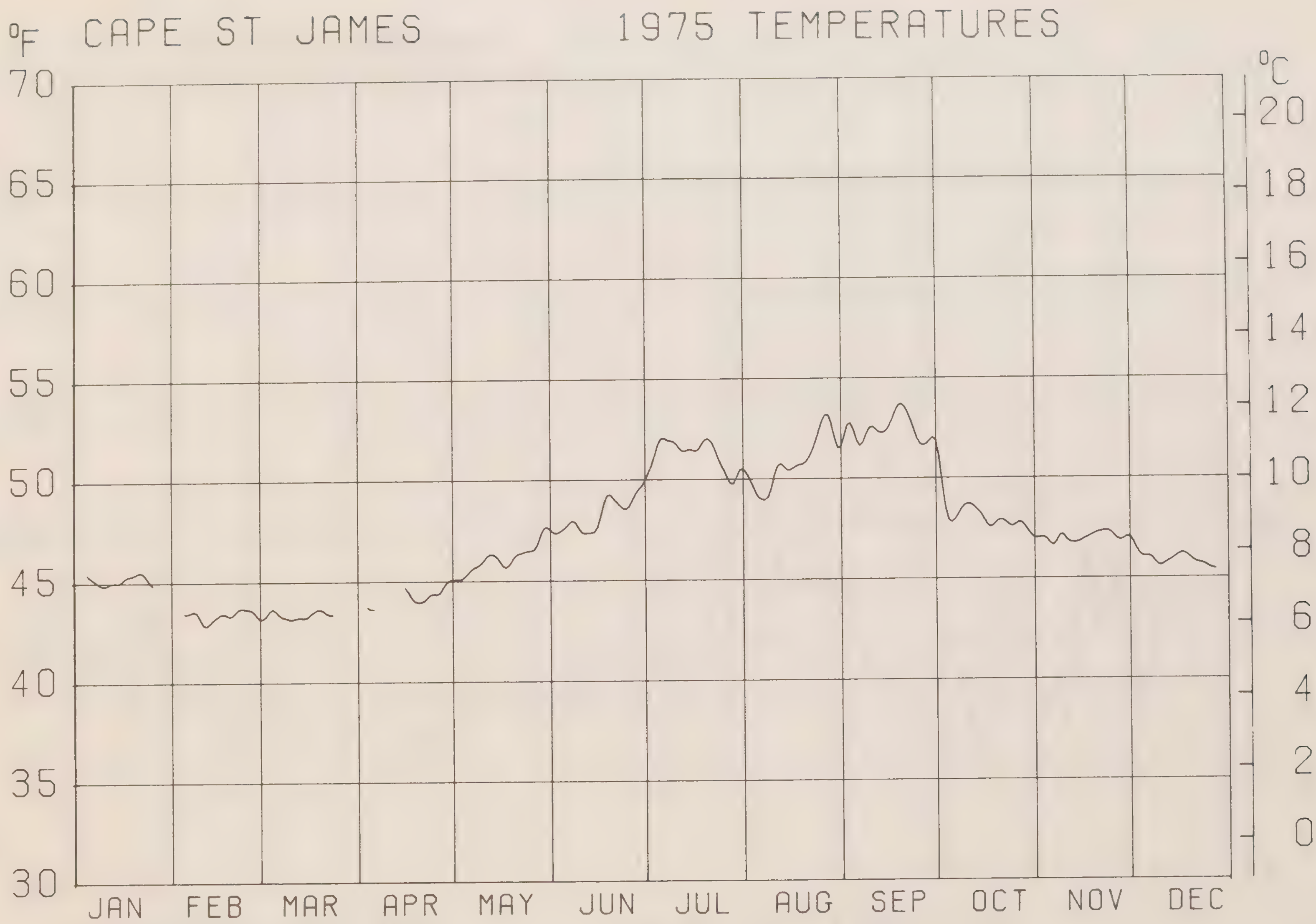
°F
CAPE ST JAMES
1975 TEMPERATURES
°C
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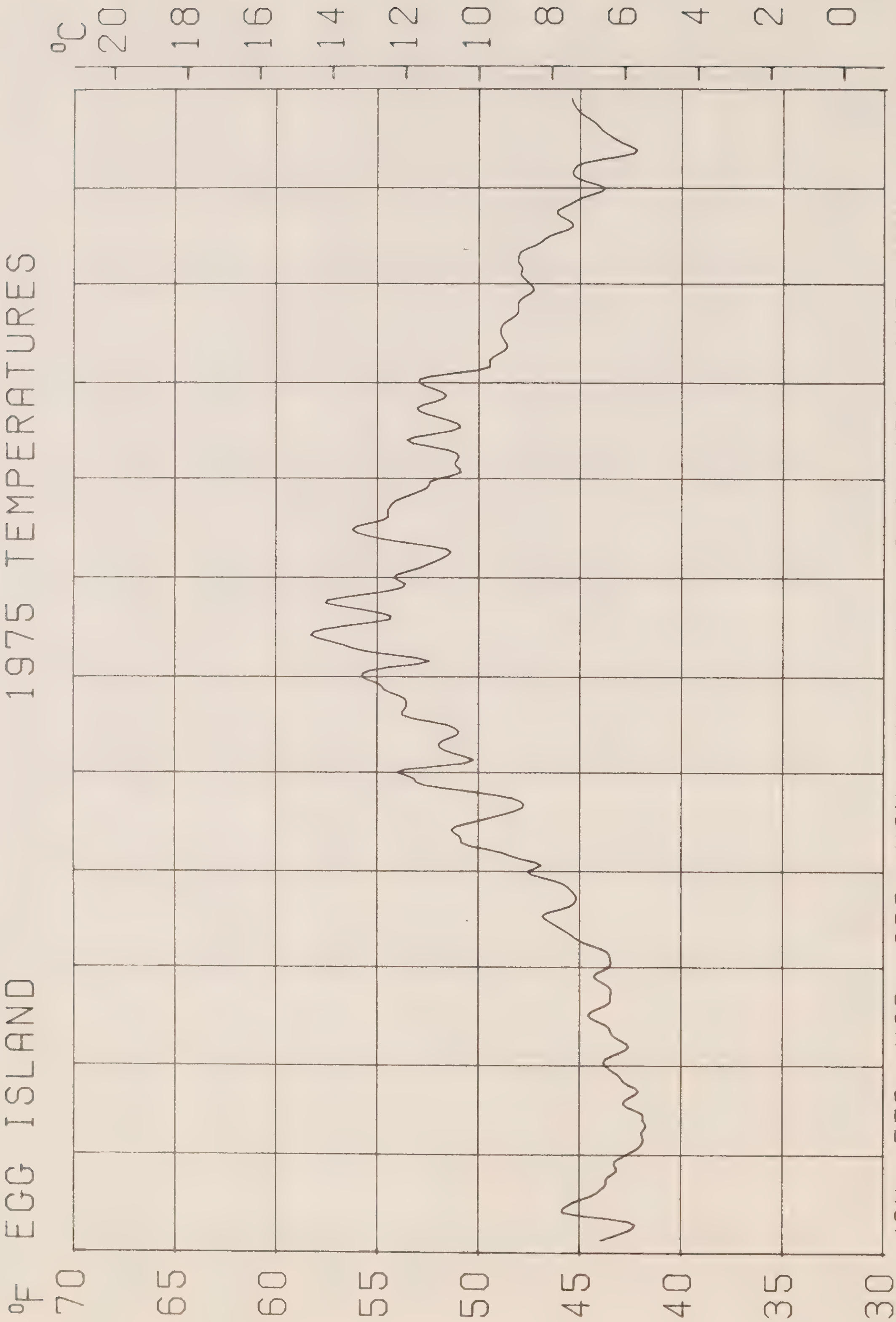

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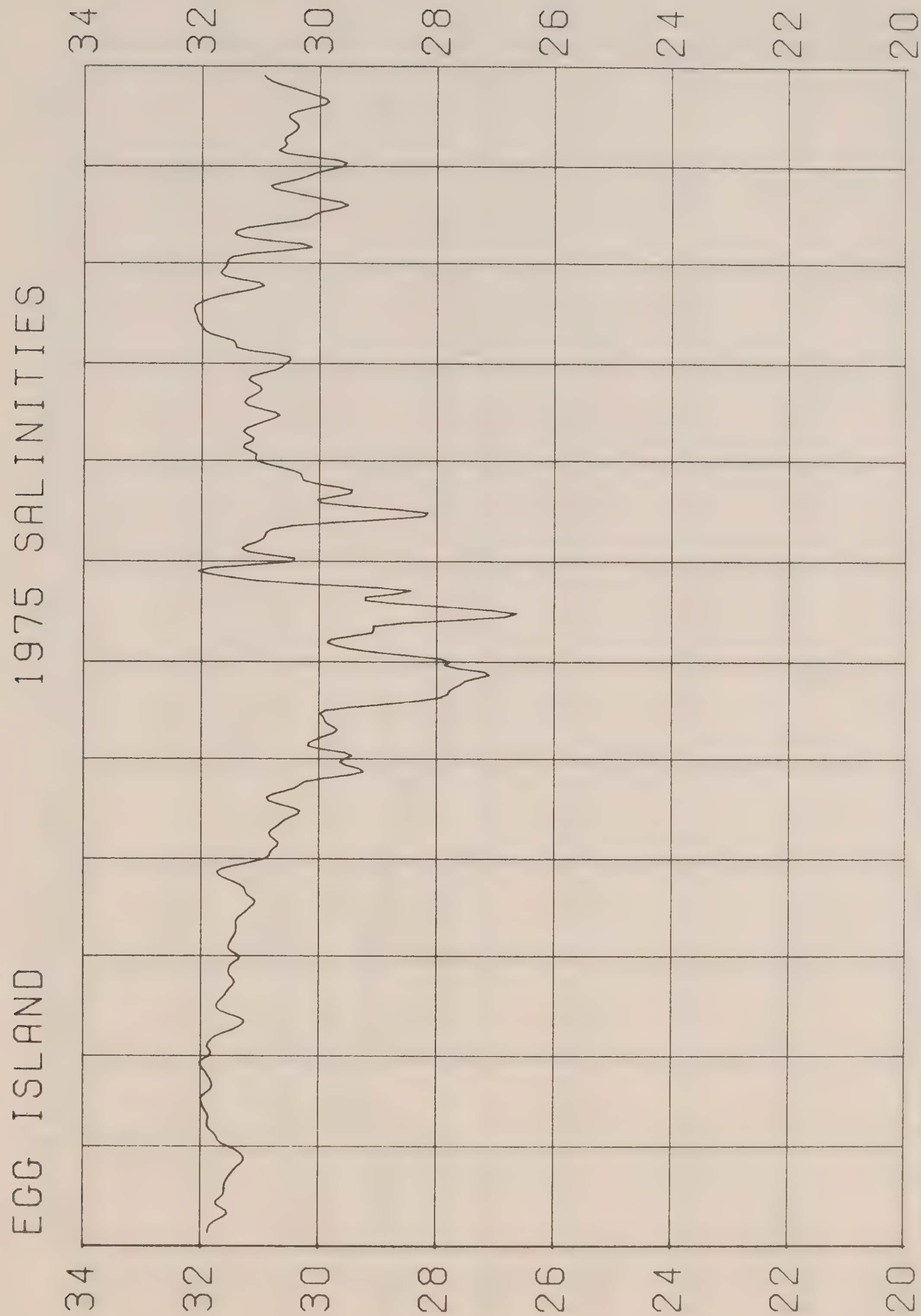

EGG ISLAND
1975 SALINITIES
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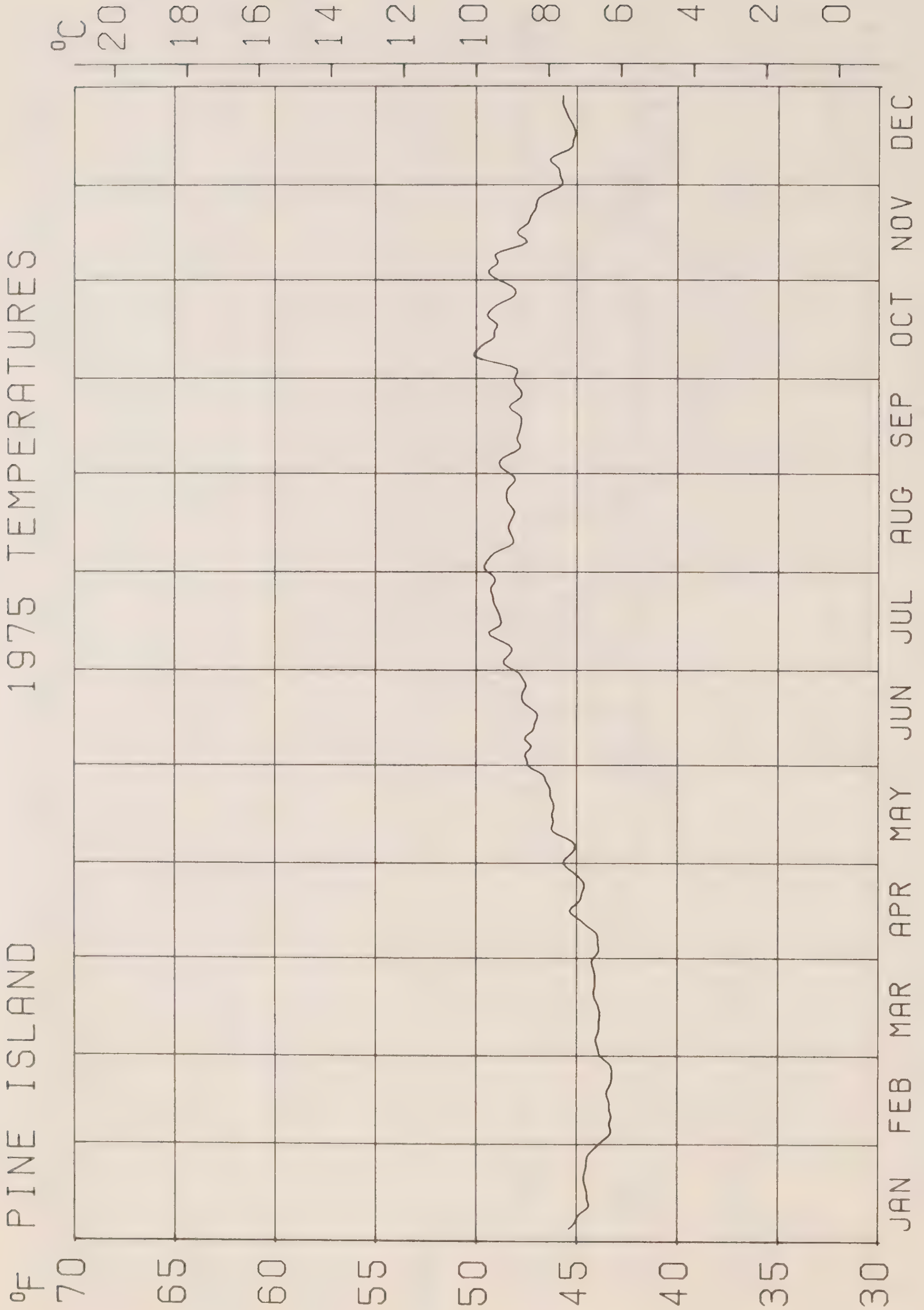
PINE ISLAND 1975 TEMPERATURES
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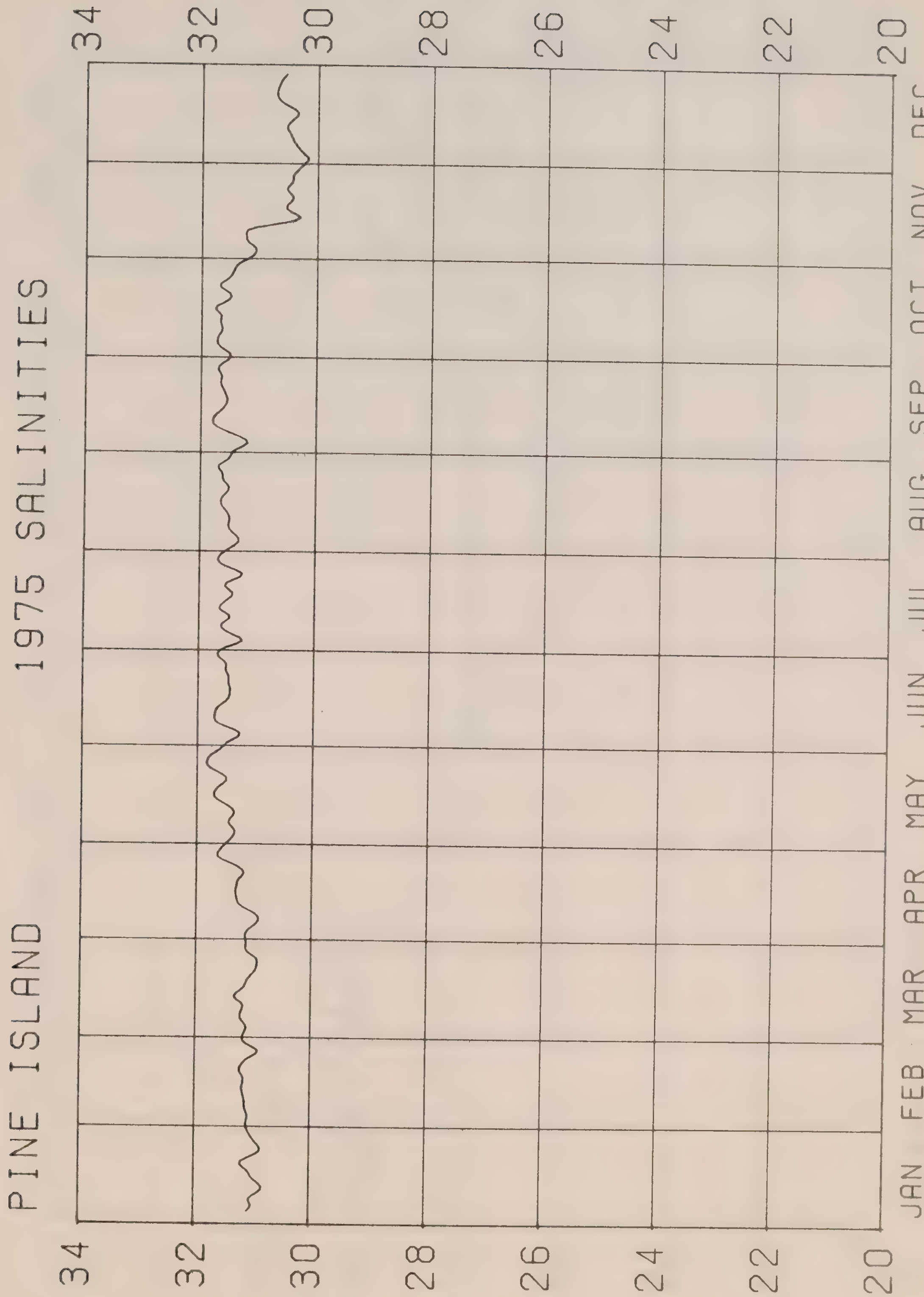
PINE ISLAND
1975 SALINITIES
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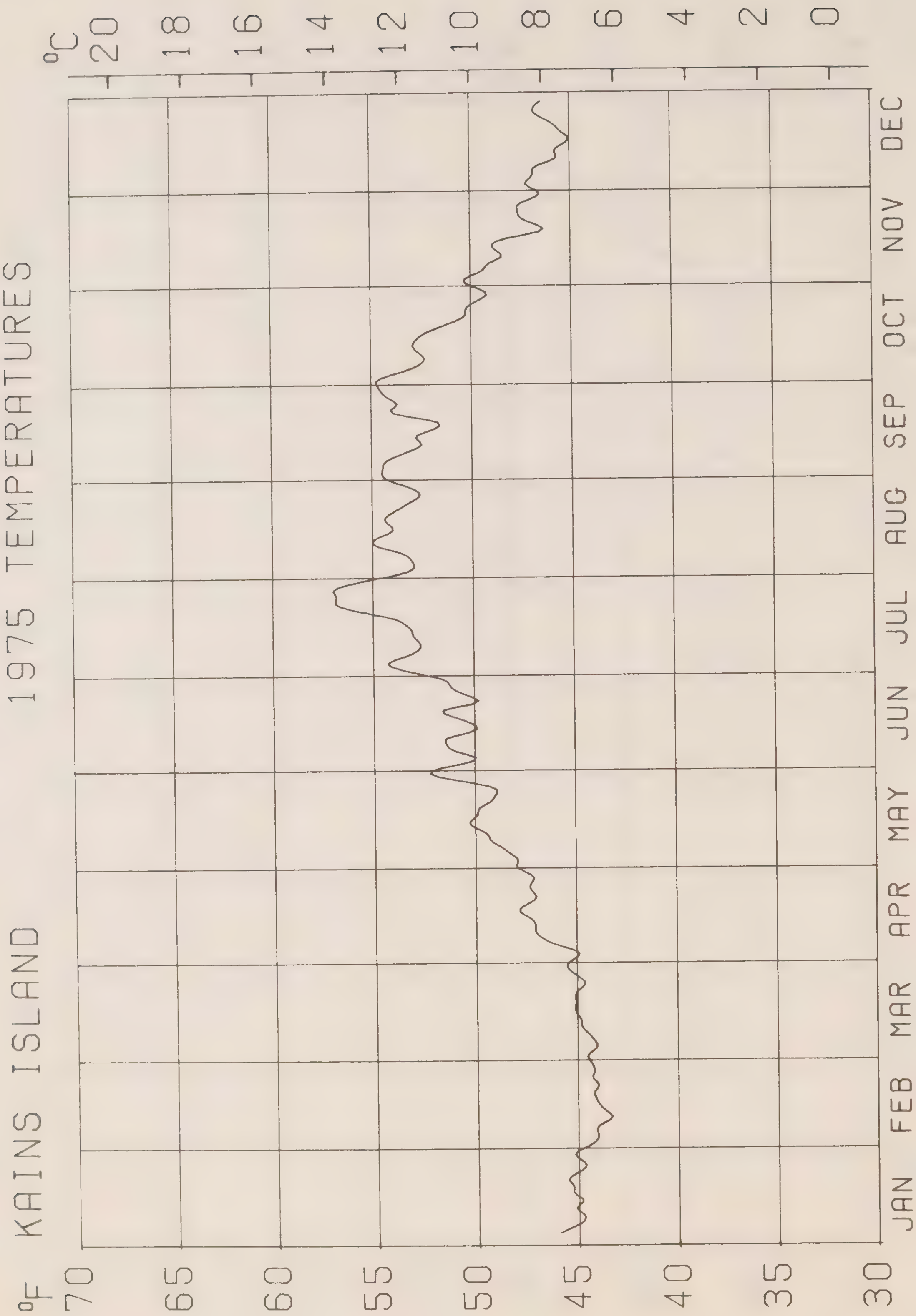
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC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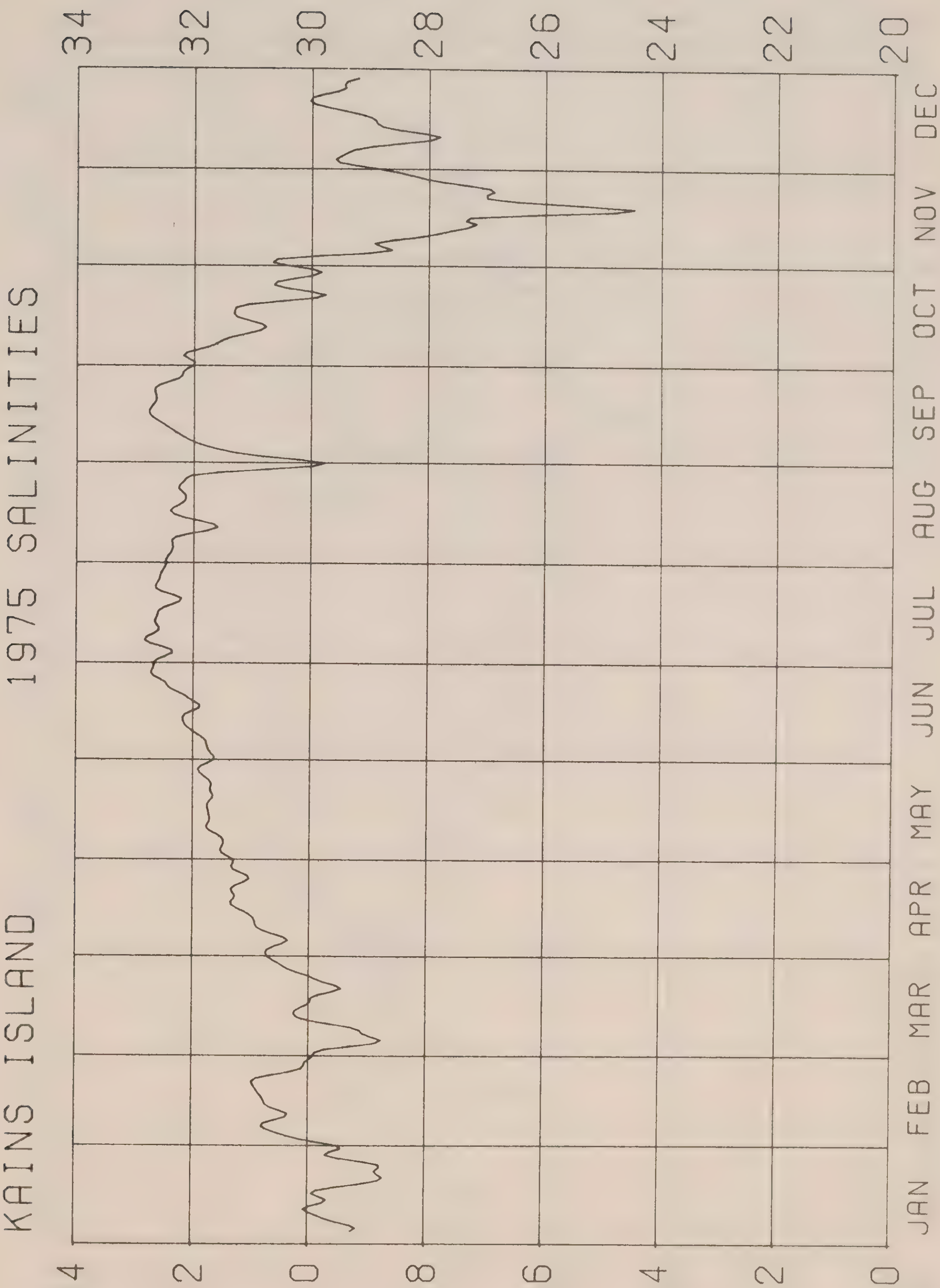
KAINS ISLAND 1975 SALINITIES
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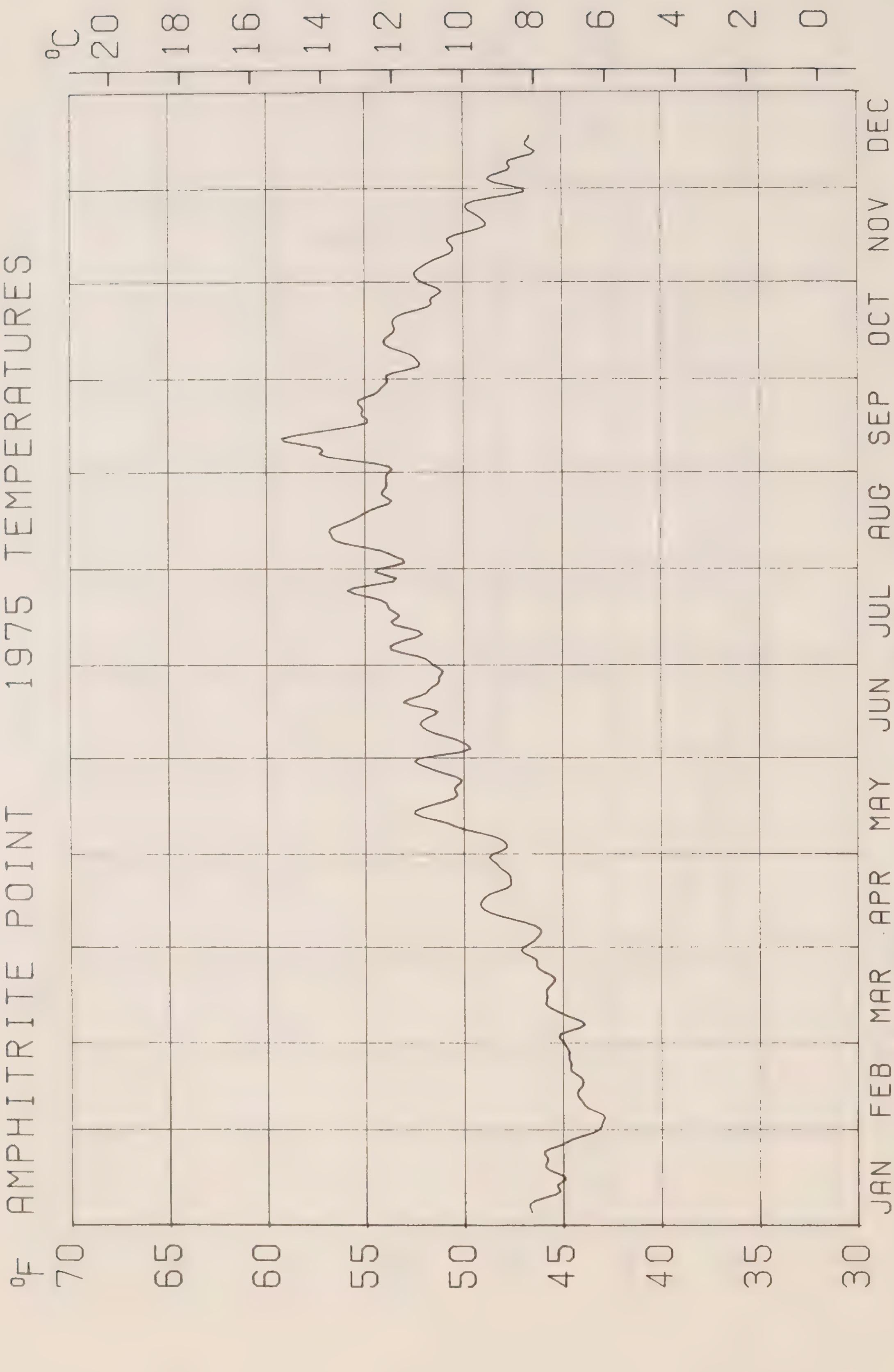
AMPHITRITE POINT 1975 TEMPERATURES
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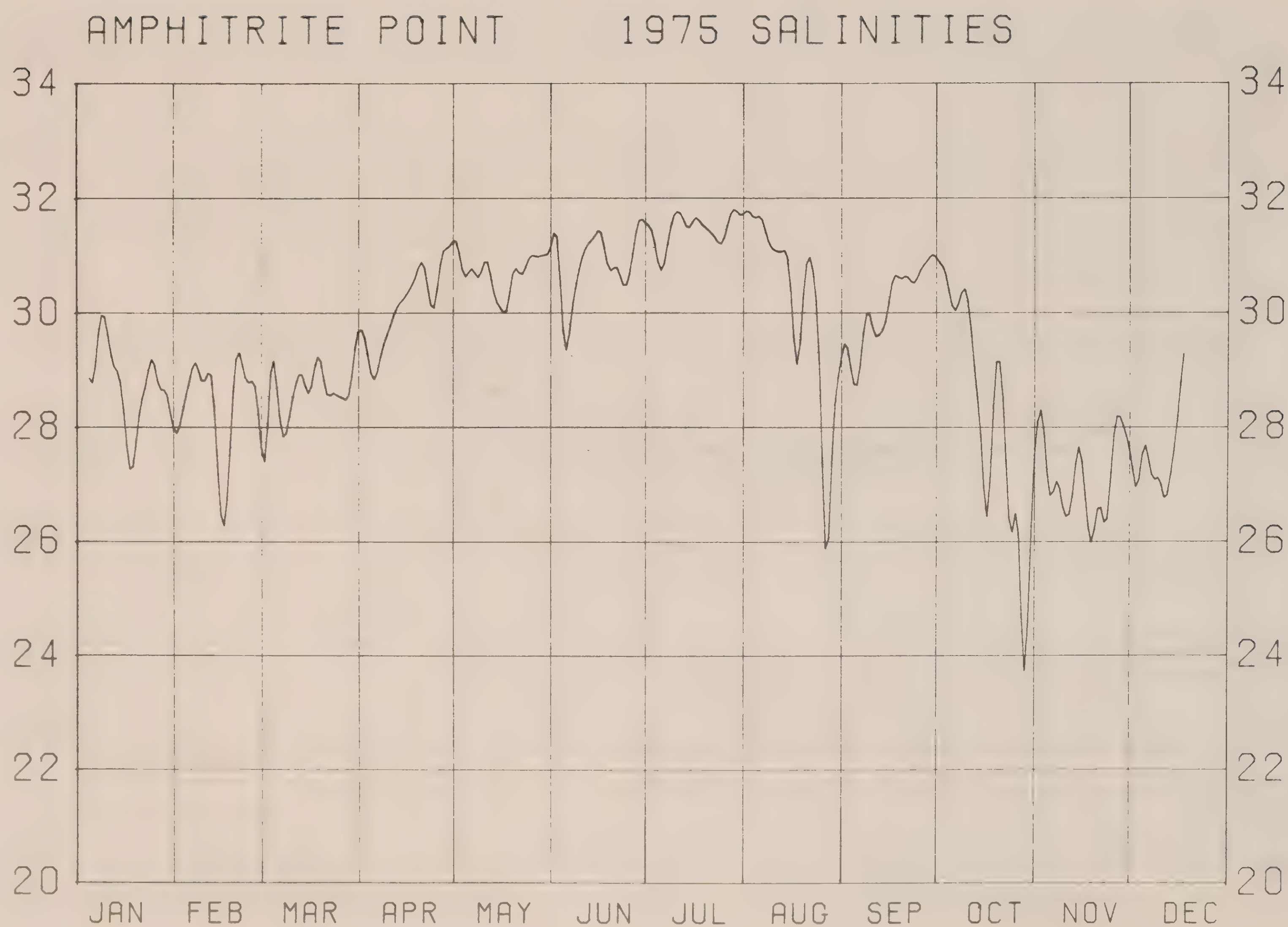
AMPHITRITE POINT 1975 SALINITIES
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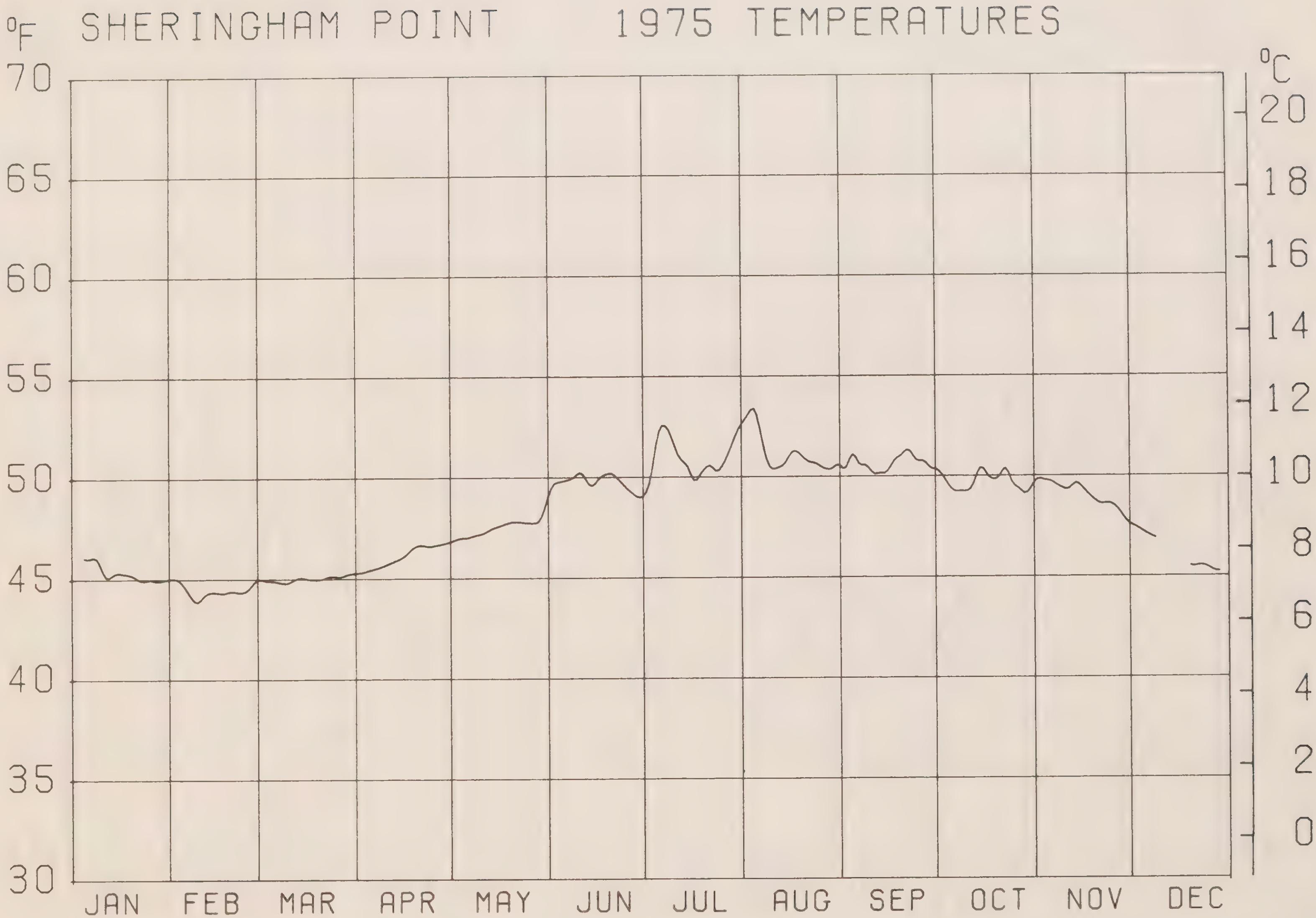
°F
SHERINGHAM POINT 1975 TEMPERATURES
°C
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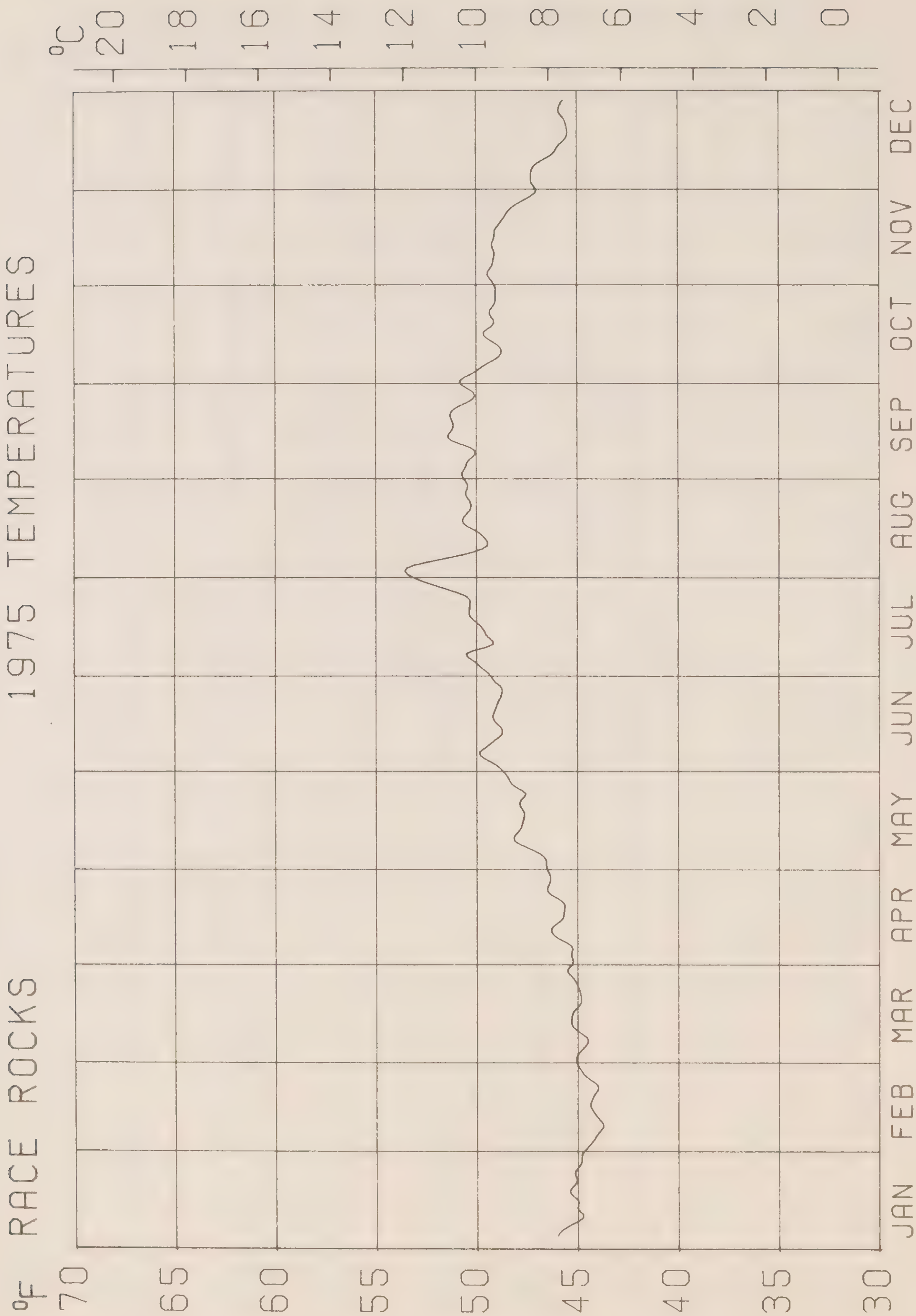

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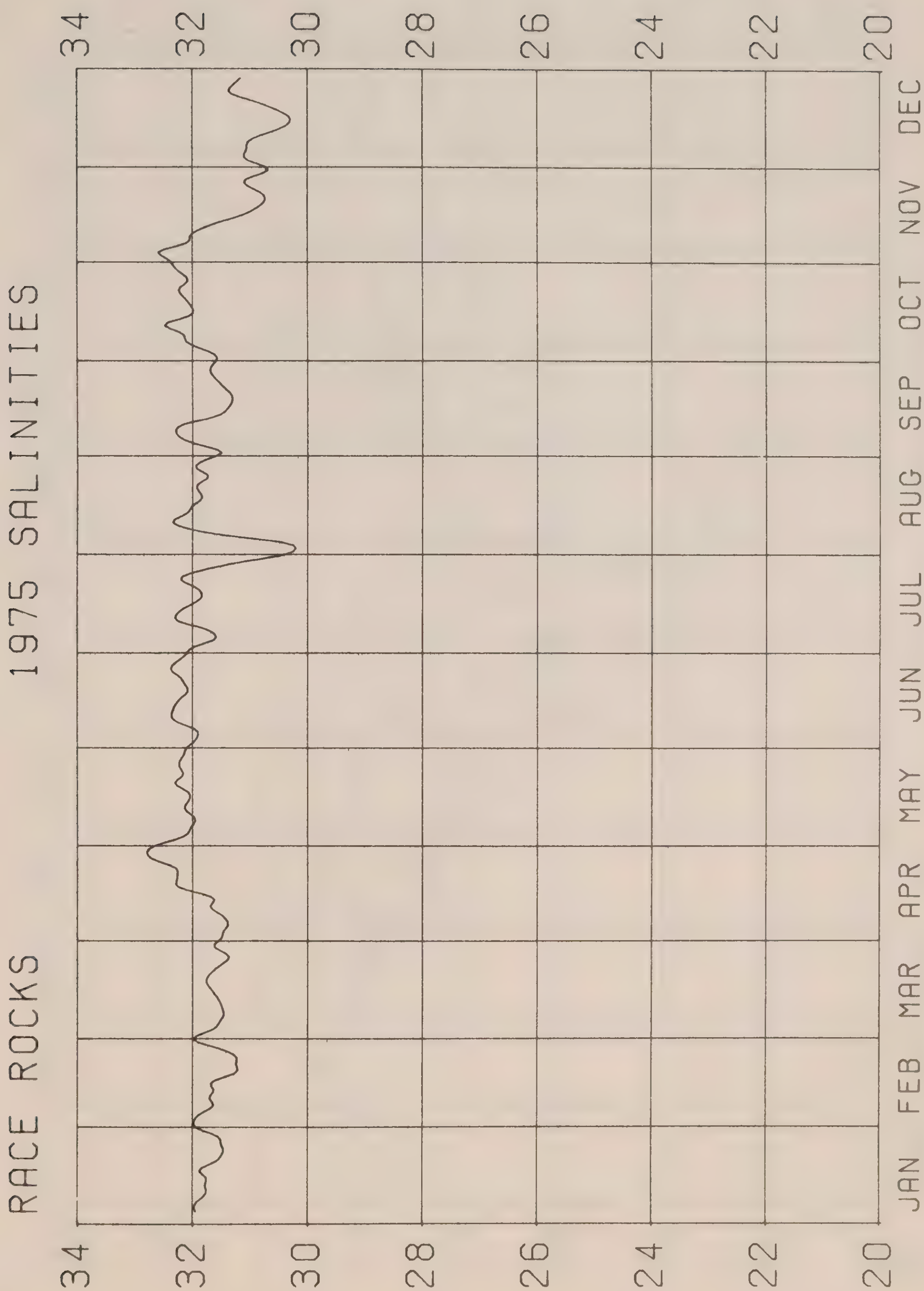
RACE ROCKS
1975 SALINITIES
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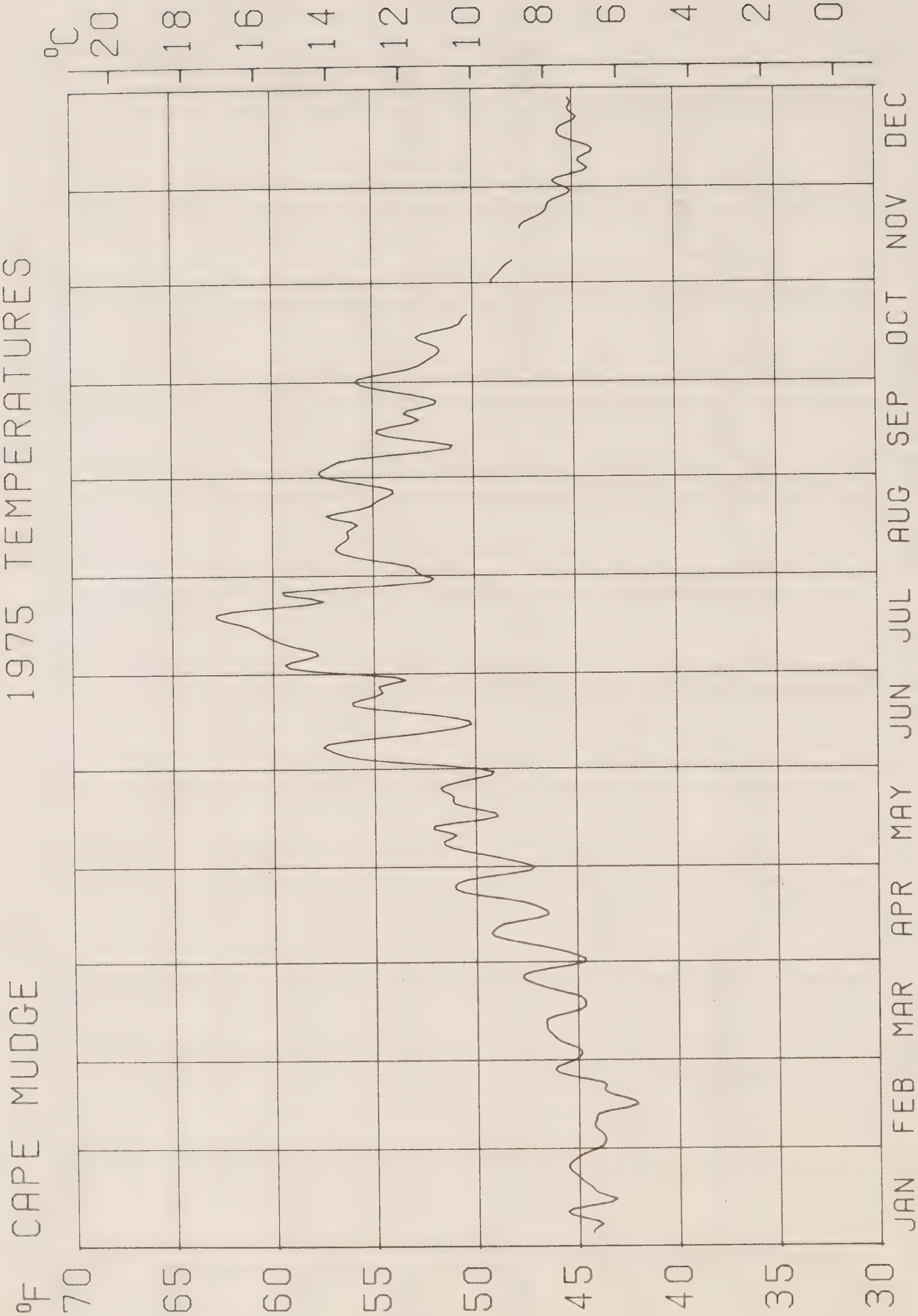
CAPE MUDGE
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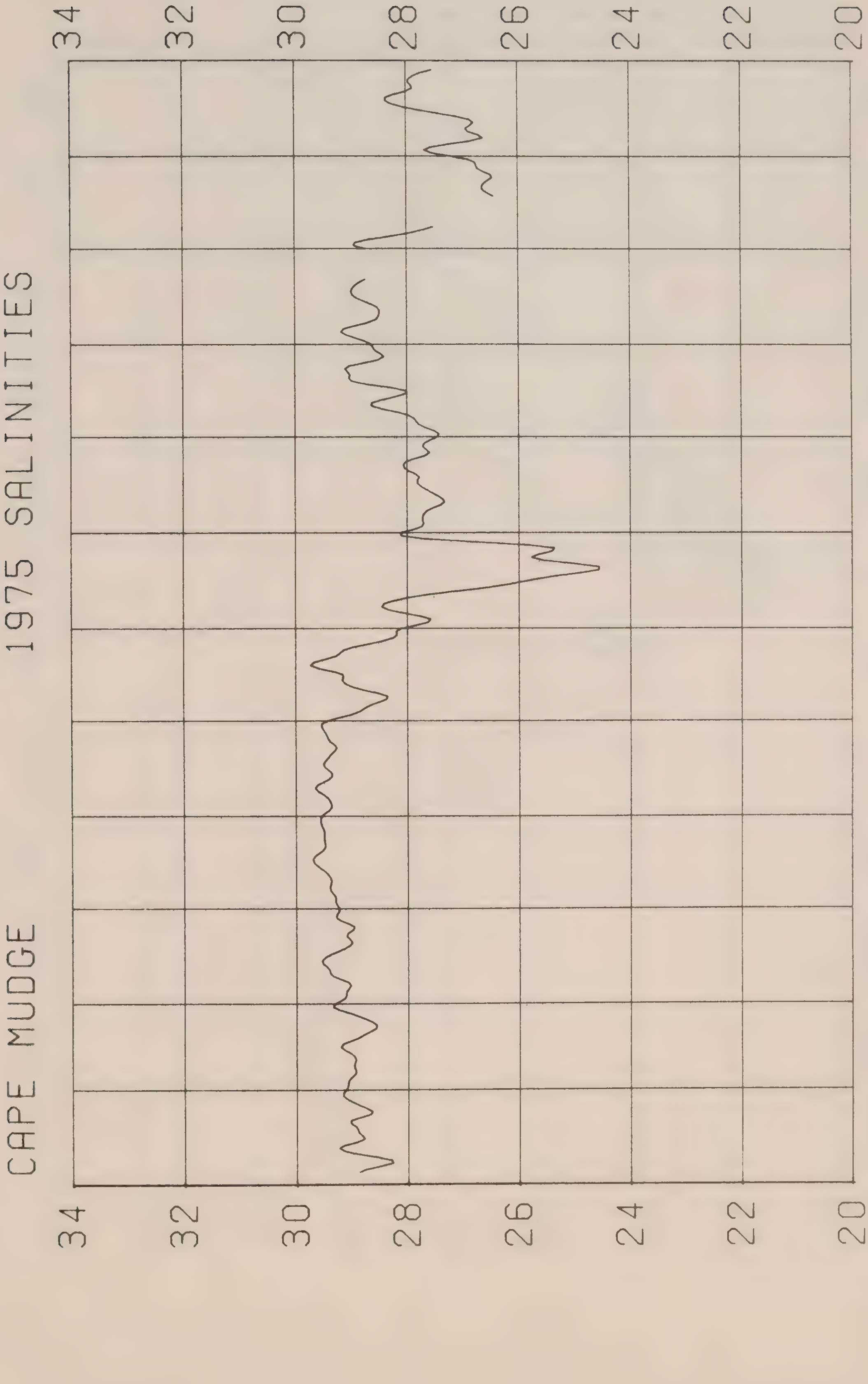
CAPE MUDGE
1975 SALINITIES
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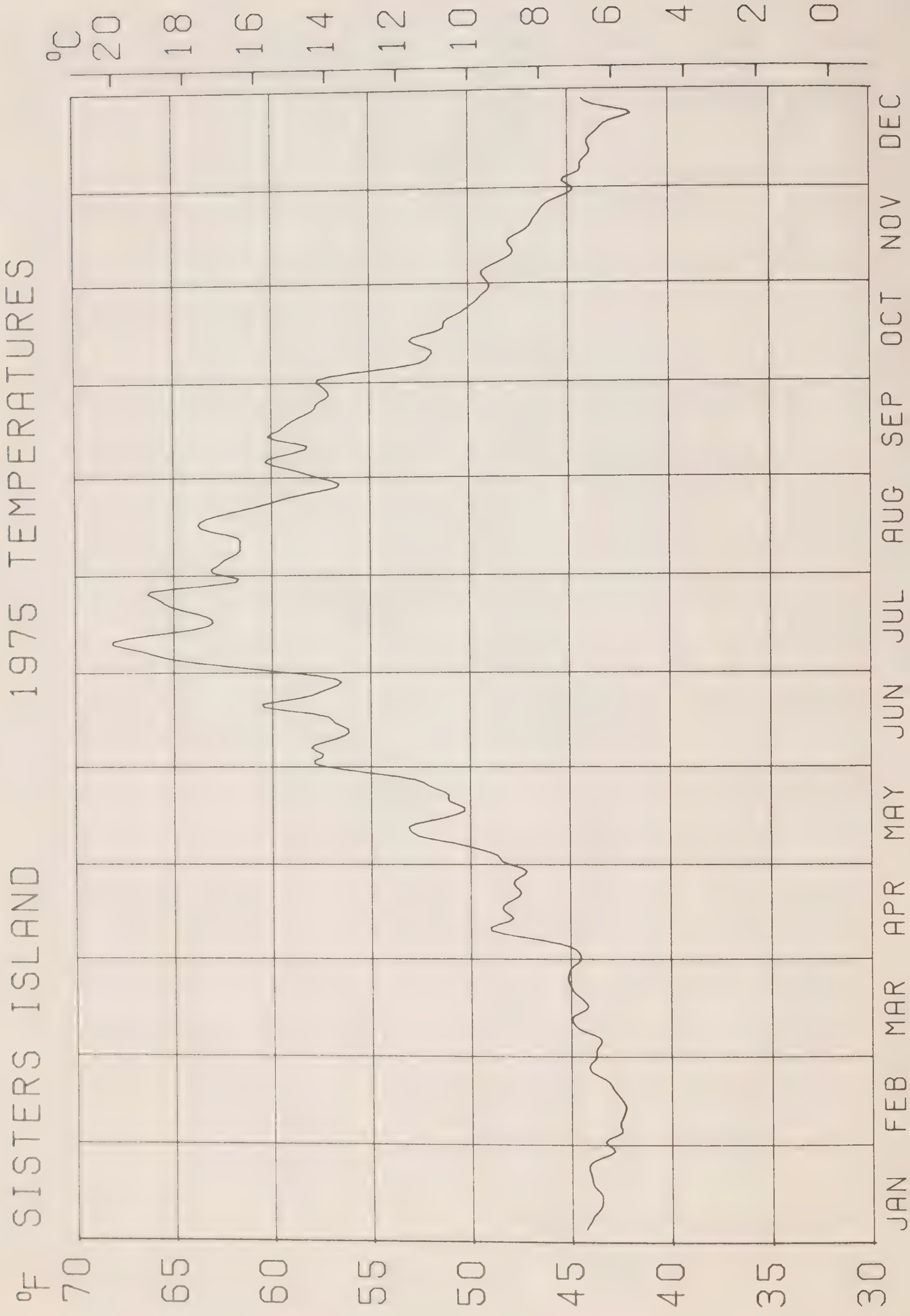
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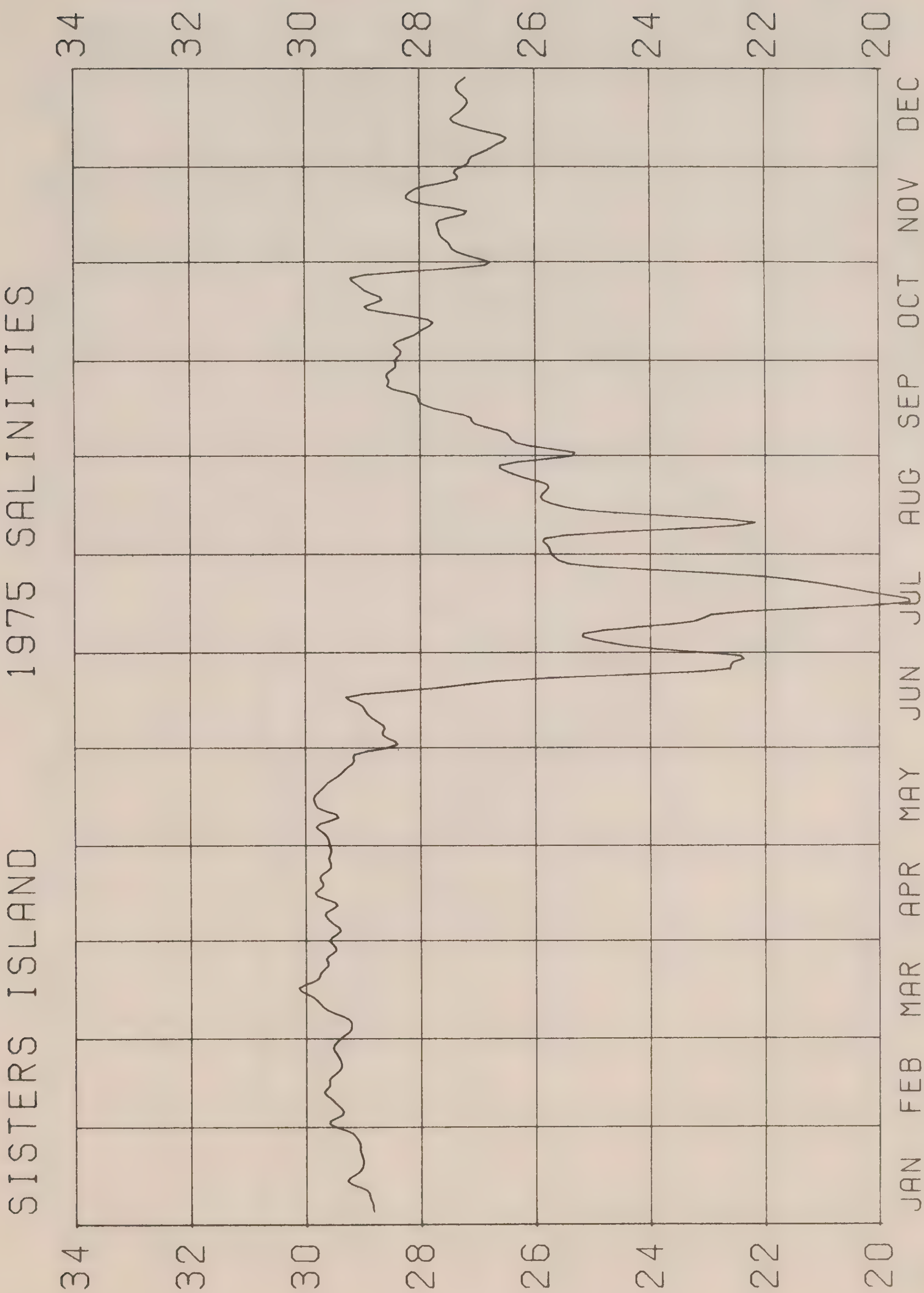
SISTERS ISLAND 1975 SALINITIES
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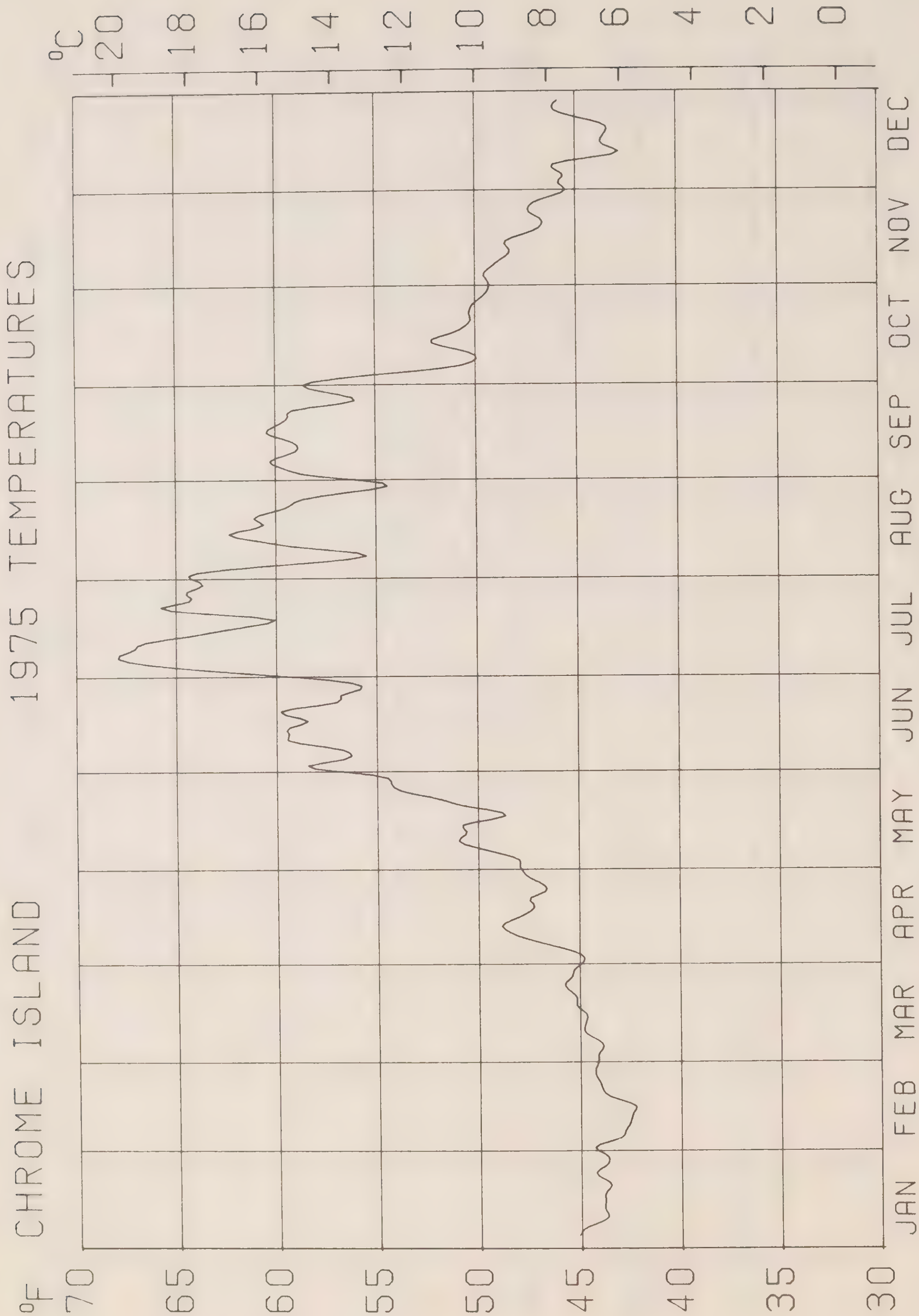
CHROME ISLAND 1975 TEMPERATURES
°F
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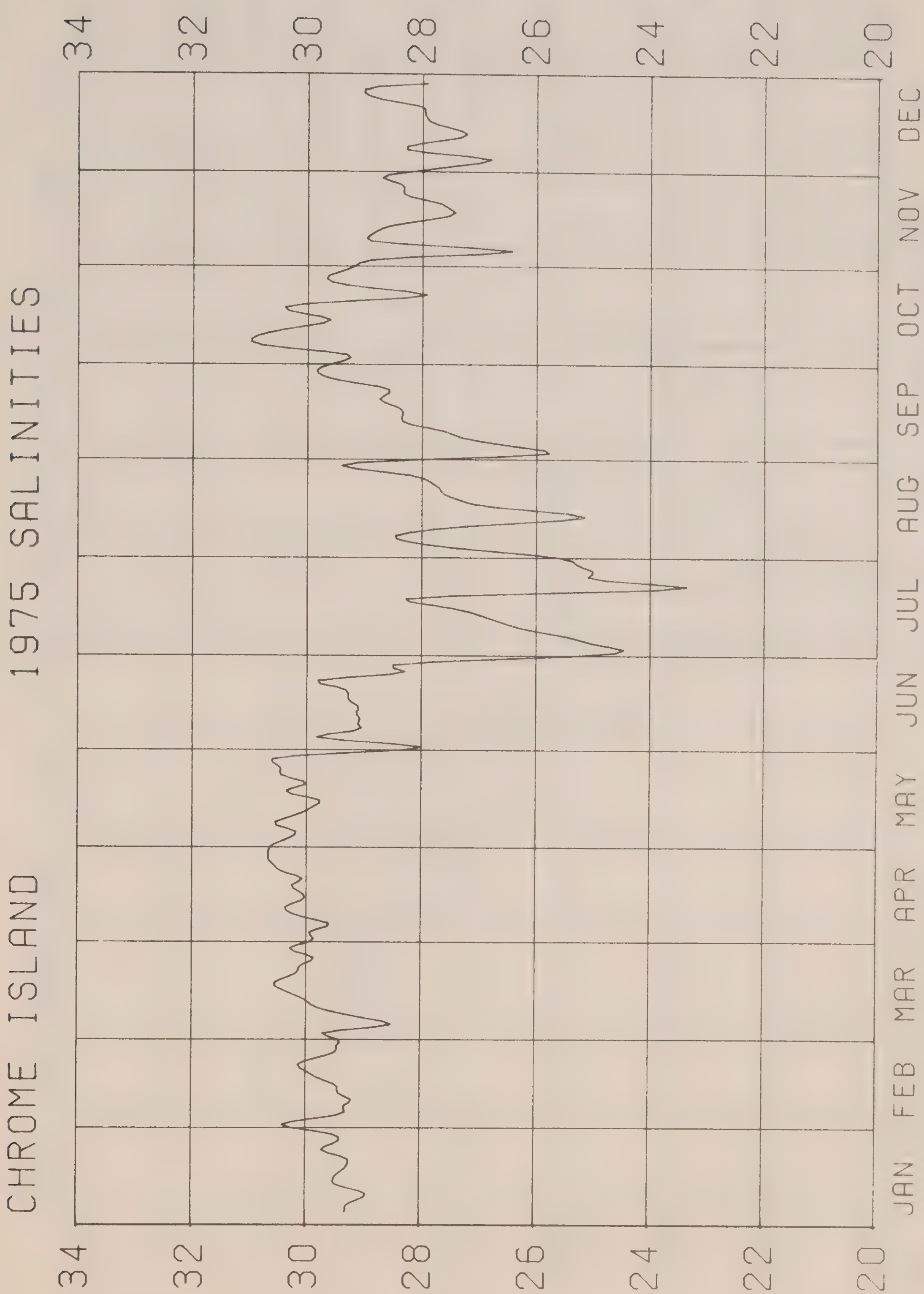
CHROME ISLAND 1975 SALINITIES
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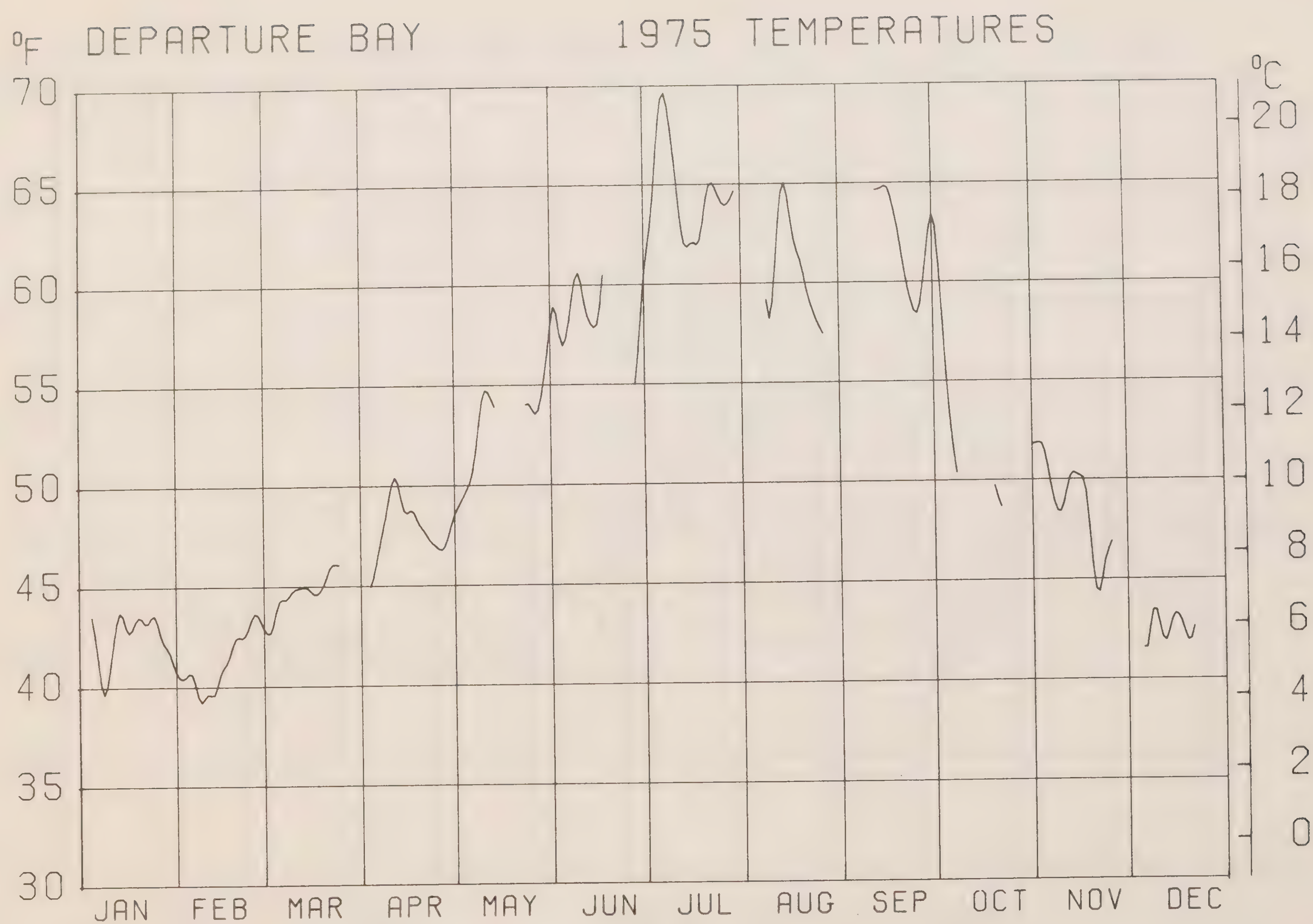
°F DEPARTURE BAY
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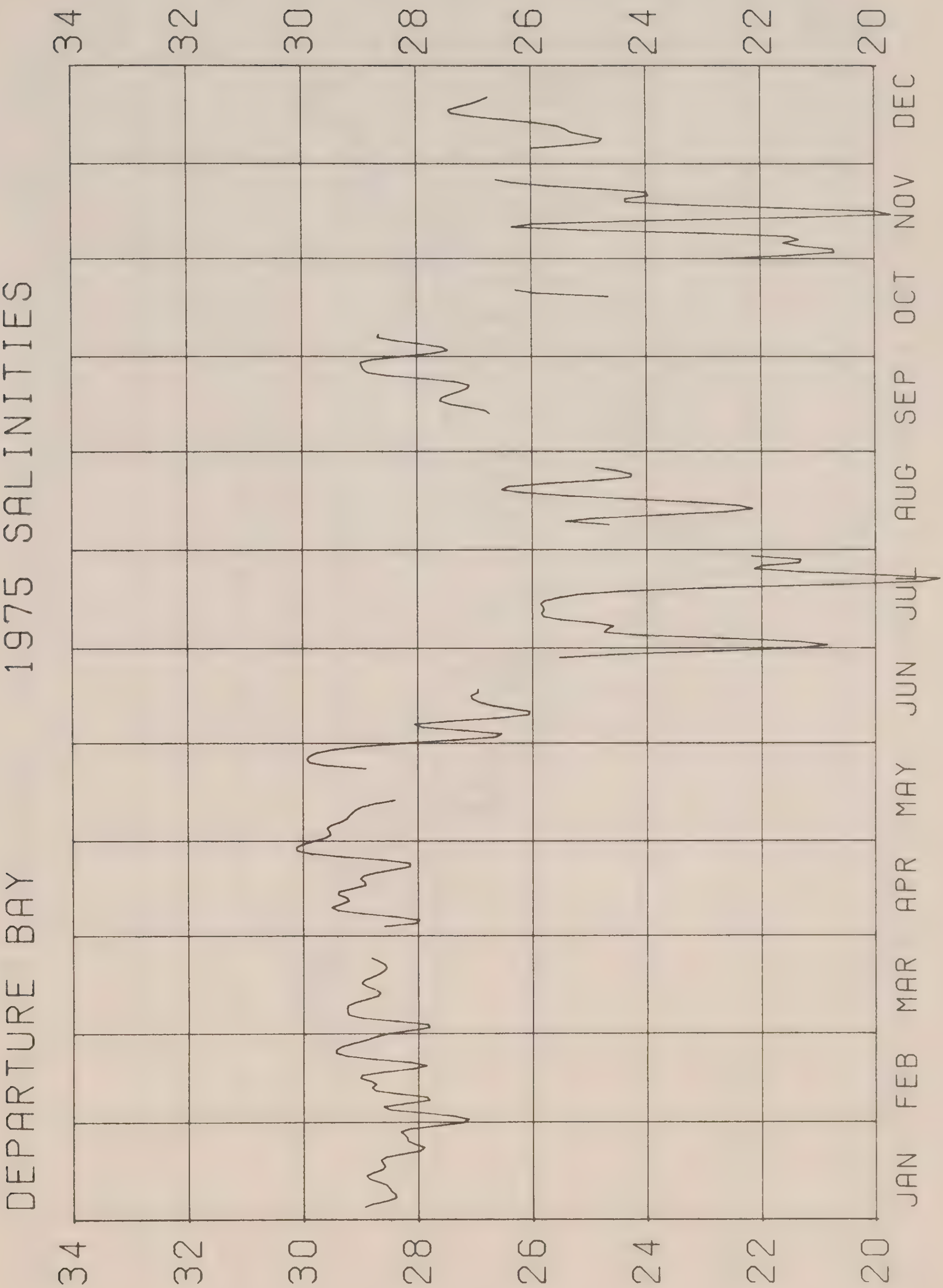
DEPARTURE BAY
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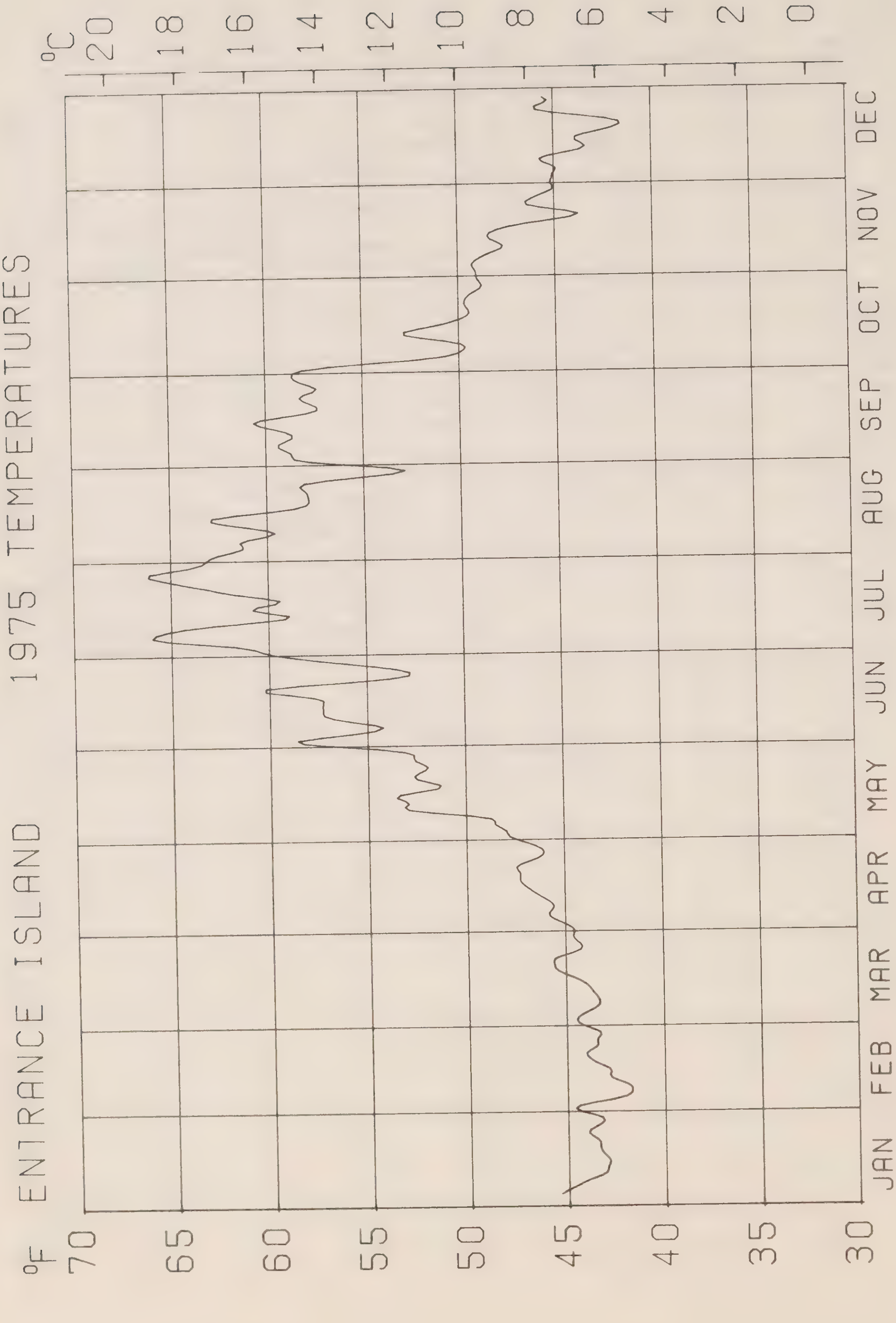
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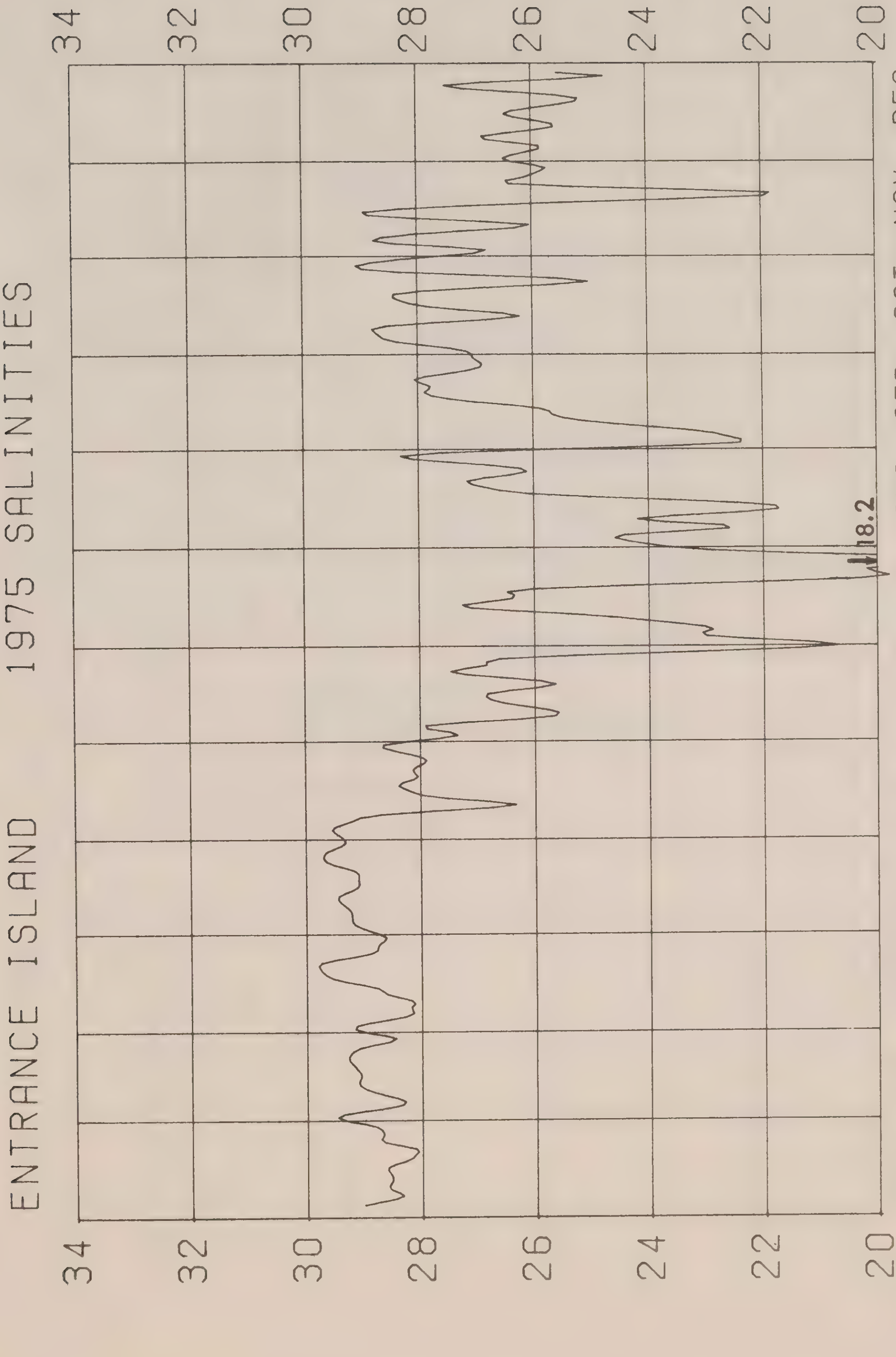
ENTRANCE ISLAND 1975 SALINITIES
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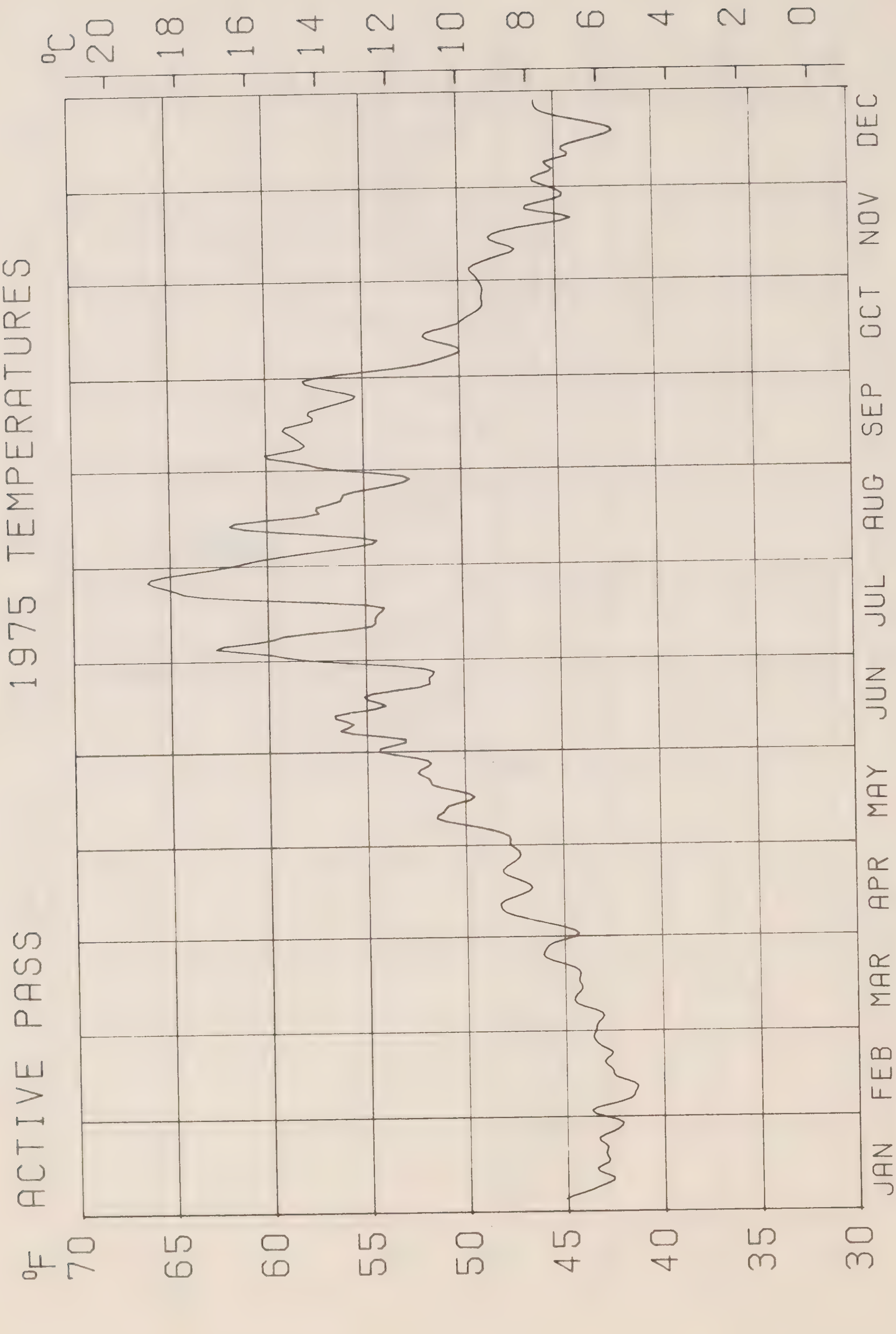
ACTIVE PASS 1975 TEMPERATURES
°F
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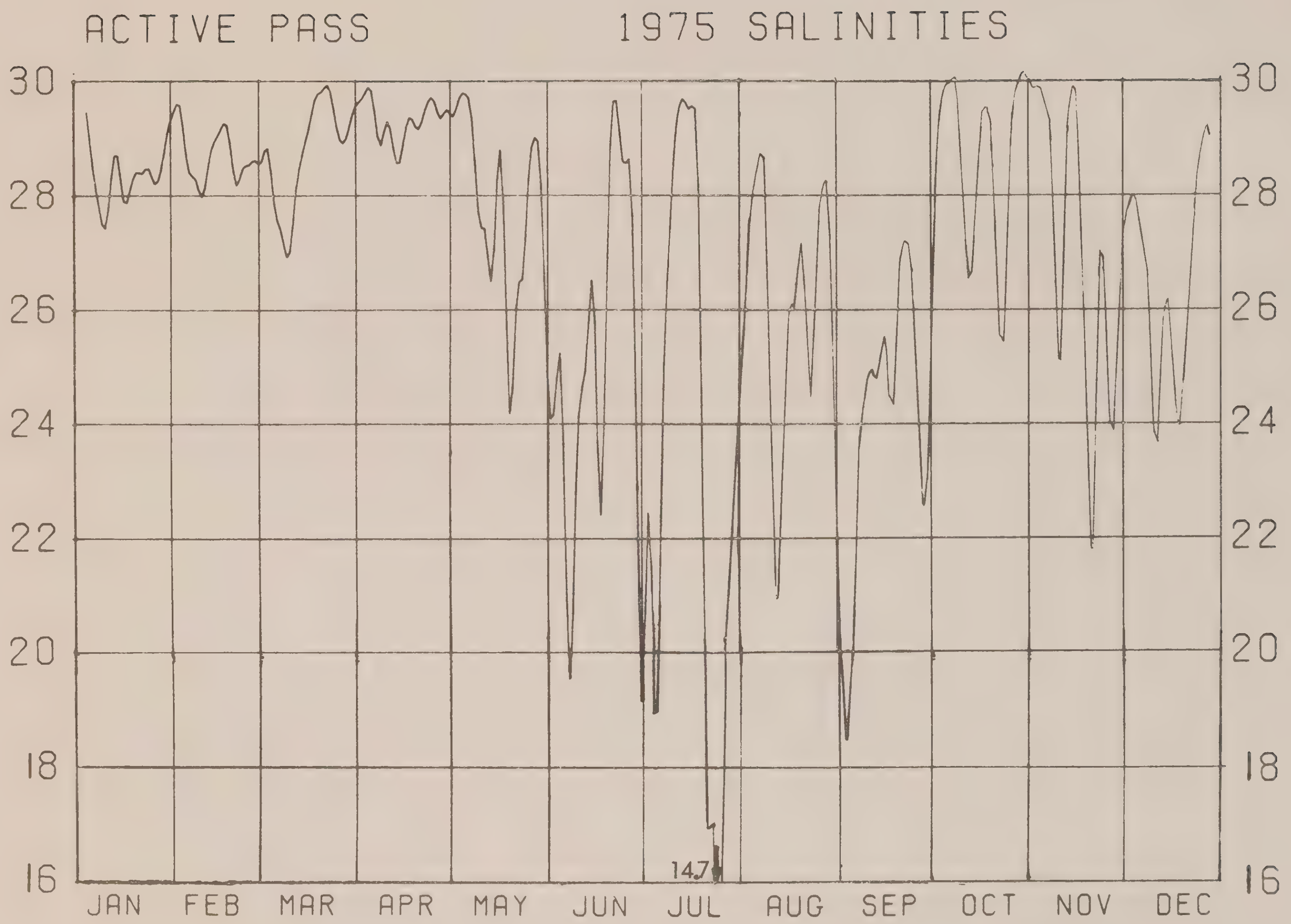
ACTIVE PASS
1975 SALINITIES
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Pacific Marine Science Report 78-9

REPORT ON OCEAN DUMPING R AND D PACIFIC REGION FISHERIES AND ENVIRONMENT CANADA 1976 - 1977

Edited by

R. O. Brinkhurst

Institute of Ocean Sciences, Patricia Bay

for

Regional Ocean Dumping Advisory Committee (Pacific)

(R.O.D.A.C. (Pacific))

INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
Sidney, B.C.

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Department of Fisheries and the Environment

Institute of Ocean Sciences, Patricia Bay

P.O. Box 6000

Sidney, B.C.

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Pacific Marine Science Report 78-9

REPORT ON OCEAN DUMPING R AND D
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Edited by

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ABSTRACT

This report summarizes the progress and results of the 1976-77 studies contracted in support of Ocean Dumping legislation and reviews a workshop held for this purpose on May 30-31, 1977 at the Institute of Ocean Sciences, Patricia Bay, Sidney, B.C.

I. INTRODUCTION

This report summarizes the progress and results of the 1976-77 studies contracted in support of Ocean Dumping legislation and reviews a workshop held for this purpose on May 30-31, 1977 at the Institute of Ocean Sciences, Patricia Bay, Sidney, B.C.

The contracted studies examine the impact on the marine environment of two dredge spoil components: wood wastes and heavy metals. Some of these studies are still in progress, so that results in some cases are preliminary. The wood waste and heavy metal topics were selected by the Regional Ocean Dumping Committee (Pacific) after it was found in 1975-76 studies at the Point Grey dumpsite (Brinkhurst, 1976) that few problems resulted from the dumping of relatively clean sediments. Rather than continue to investigate individual dumpsites, it was decided that attention should be transferred to specific materials of major concern.

The wood waste subject was selected as a result of the many applications which were being received for permission to dispose of material dredged from around forest industry installations. This dredged material comprised bottom sediment and wood particles ranging in size from fibre to logs. Information on the effects of dumping this material was required. The separation of the effects of dumping wood waste spoil from the effects of other wastes entering the system at the same general location presents a challenge, especially where the installations are located at the head of a fjord as is often the case in the region. As Alberni Inlet receives relatively few other wastes and because it has been studied intensively for its fisheries and the environmental impact of the forest industry, this fjord was selected for the wood waste study in order to profit from previous experience.

Materials deposited at the Point Grey and other dumpsites contain heavy metals and concern arose over their concentration and mobility. Mercury, in particular, has a long residence time and disturbance of sediments through dredging and dredge spoil dumping could remobilize mercury which had deposited in the sediments over the years. Contracts were therefore let to examine the mobilization and biotransformation of mercurials and investigate heavy metals accumulation by a selected marine benthic organism.

The wood waste and heavy metals topics are discussed in Sections II to IV. Section V deals with the contract studies and discussions that developed at the Ocean Dumping Workshop, and covers other smaller contracts. A list of the 1976-77 contact reports now available is given in Appendix 1. Copies of the reports are filed in the libraries of the Institute of Ocean Sciences, Patricia Bay, Sidney, Environmental Protection Service (West Vancouver) and Environment Canada (Ottawa). 1977-78 contracts are listed in Appendix 2.

II. STUDIES AND RESULTS

A. WOOD WASTE STUDIES

All of the wood waste studies were conducted in Alberni Inlet, B.C. The studies, with their respective contracted consultants are as follows:

1. The effects of dumping dredge spoils containing wood debris on benthic communities in Alberni Inlet, B.C. (Dobrocky Seatech, Ltd.).

2. The characteristics of Alberni Inlet dredge spoils (Dobrocky Seatech, Ltd. and Econotech Services, Ltd.).

3. The toxicity of leachates from dredge spoil collected in Alberni Inlet (E.V.S. Consultants Ltd.).

4. An oxygen budget for Alberni Inlet (Seakem Oceanography Ltd.).

5. Underwater coring techniques for areas with extensive wood debris (B.H. Levelton and Associates Ltd.).

Study 2 has been continued into the 1977-78 fiscal year and hence the data summary is based on preliminary results.

1. The effects of dumping dredge spoils containing wood debris on benthic communities in Alberni Inlet, B.C.

Alberni Inlet is 69 km long, 1.3 km wide on average. A 40 m deep sill separates it from the ocean, but a circuitous channel, Junction Passage, provides an alternate source of exchange to 88 m depth. A second sill at Sproat Narrows (37 m depth) separates the upper basin from the middle basin, and the former receives the Somass River. A kraft pulp and paper mill, saw mill and plywood mill are located at the head of the inlet. Renewal of the deep water seems to be an annual event according to Bell (1976).

Twenty stations (Fig. 1) were sampled in the upper basin for benthic fauna in November, 1976, two replicate 0.1 m^2 Smith-McIntyre samples being obtained at each site. The analyses of samples produced a data matrix of 106 species by 40 samples, and a cluster analysis was performed on the data, using Czekanowski's coefficient, producing the dendrogram shown below (Fig. 2). Biotic provinces were delineated (Fig. 3) which demonstrated the effect of dumping as pronounced but localized to the dumpsite proper. Successively decreased disturbance occurred to the "wood debris province", "dumpsite fringe", "central fringe" and "central province" where wood debris was generated from log booming and storage. Several infaunal species recurred at stations where wood debris was present, apparently due to their ability to rapidly colonize disturbed areas or utilize wood as food or habitat. Particularly indicative of the presence of wood debris were the polychaetes *Capitella capitata*, *Dorvillea* spp. and *Prionospio steenstrupi*, the crustaceans *Nebalia*

pugettensis and *Limnoria lignorum* and the wood boring teredinid bivalves. These species have been implicated as indicative of wood waste beds by other workers on the Pacific northwest coast.

Qualitative samples of larger epifauna (> 6 mm size) were taken by epibenthic sled at 5 stations in the centre channel of Alberni Inlet. Twelve species were collected, comprising molluscs, shrimps, crabs and bottom fish. Standing crop values were obtained for infauna of the mollusca, crustacea and polychaeta larger in size than 1 mm.

An in situ respirometer was developed to measure benthic respiration rate at the Alberni dumpsite. However a poor seal to the substrate was obtained, no doubt due to the uneven nature of the bottom related to dumping. Despite this, the benthic oxygen uptake was observed to be very small, consistent with the lack of benthos. A better seal was made in the "wood debris province" and values of 17.6 to 23.8 mg $O_2/m^2/hr$ were obtained, comparable to values measured in Puget Sound at varying depth and substrate type. Dissolved oxygen measurements at these sites revealed that the benthic respiration measurements had been taken at the threshold level (1.3 mg O_2/ℓ), below which respiration rate became coupled with oxygen concentration. It was thus anticipated that the rate of benthic oxygen consumption would be higher in summer as dissolved oxygen levels became depressed. Further benthic respiration measurements are in progress in the 1977-78 fiscal year.

A series of test wood blocks of freshly cut and waterlogged Douglas fir and hemlock were immersed at the head, centre and mouth of the upper Alberni Inlet basin in order to examine wood borer infestation rates as a function of depth, proximity to a pulp mill outfall and period of immersion. Wood borer penetration frequency was tabulated and the bores of teredine molluscs examined for size and approximate age.

2. The characteristics of Alberni Inlet dredge spoils rich in wood waste and the predictive value of pre-dump analyses

Sediment cores and dredge samples were collected at sites in Fig. 1 by Dobrocky Seatech Ltd. in November, 1976 and analysed by Econotech Services Ltd. for % sawdust, chips, bark, fibre, total organic carbon (TOC), volatile solids, heavy metals, biochemical oxygen demand (BOD) and lignins. Liquid collected with the dredge spoils was removed for measurement of these parameters and determination of toxicity to shrimp and stickleback (toxicity tests by E.V.S. Consultants Ltd, section 3).

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*In the report it is suggested that the dump site is at station 11, but in fact station 9 is closer to its center. Thus the effects on the dump site cannot be directly estimated as the samples obtained (stations 10 and 12) were not from the most affected area.

Upon removal of the bulk of this liquid, the dredge spoil was placed in a 75 cm diameter polyethylene lysimeter to a depth of 40 cm and fresh seawater introduced to a depth of 10 cm over the sediment and maintained at 8°C. Samples of interstitial water 10 cm below the sediment surface were removed after 1 and 2 months' incubation and analysed for oxygen, H_2S, BOD, COD, TOC and heavy metals. The 2 month sample was bioassayed as for the original decanted liquid. H_2S evolution was also measured at monthly intervals from small quantities of dredge spoil housed in 15 x 38 cm mini columns.

Due to the long time period which had elapsed between sample collection and analysis (approx. 14 days) and the necessary introduction of some fresh seawater into interstitial water samples, some high variability in the data arose which rendered conclusions tentative. High levels of oxygen uptake and hydrogen sulphide production were measured for sediments with high levels of volatile solids, particularly those containing fibre. High heavy metal levels were measured from dredge samples located near the pulp mill outfall (sites B, C) and the dump site (site 12). Most samples when collected were covered by a white fungal or algal film and contained no benthic organisms.

Core samples taken at each of the grab sampling stations (Fig. 1) showed high volatile solids and lignin content around the dump site (stations 4, 5, 9), on the opposite shore where log booming is intensive (8, 13, 17, 18) and below the dump site (19, 20).

From these analyses it is apparent that dredging and dumping these materials can cause reduced oxygen, high hydrogen sulphide, heavy metal levels and increased turbidity. It may be possible to predict the intensity of these effects. BOD_5 analysis was found to provide a good estimate of the oxygen depletion capability of the sediment. Given a knowledge of the sediment type and oxygen concentration in the overlying water, the oxygen uptake rate can be calculated. Volatile solids and visual estimate of % fibre content also will predict sediment oxygen demand. Controlled H_2S testing on the liquid derived from dredged spoil could become a useful alternative to the BOD test. This study is continued in the current fiscal year.

3. The toxicity of leachates from dredge spoil

The toxicity of leachates from the 5 dredge and 2 dump site samples extracted 14 days after collection and 2 months after incubation were tested with the shrimp *Crangon* spp. (primarily *C. communis*) and the stickleback *Gasterosteus aculeatus* against the reference toxicant sodium pentachlorophenate. The tests were performed in duplicate as 96 hour LC50's to generate toxicity curves. S values were not calculated due to a lack of partial survival data. Organism loading density, initial and final pH, salinity, temperature and oxygen were monitored, but not strictly maintained at *in situ* levels.

Dredge spoil leachates were toxic to both organisms, but were 3.3 times less toxic to *Crangon* spp. than *Gasterosteus aculeatus*. The reference toxicant was 4 times less toxic to *Crangon* spp. Shrimp parasitized by *Sylon hippolytes* (a rhizocephalan cirripede which extracts the host's body fluids externally through the abdomen) were more sensitive than the normal population, but ovigarous females, especially in January, were less susceptible. Leachates from dredged material with a high fibre content appeared to be most toxic. However, oxygen demand and H_2S levels varied widely in the test solutions and did not approach in situ conditions. Although bioassay results did not correlate with chemical analysis of known toxicants including H_2S, these two variables are so sensitive to handling procedures, as well as to the variable nature of the original substrates from which the samples were obtained, that the results of the toxicity tests should be interpreted with caution.

4. Oxygen budget for Alberni Inlet

In late 1976, the possibility arose of moving the approved dump site further down Alberni Inlet. In order to formulate an overall assessment of the Alberni Inlet upper basin a contract was let to Seakem Oceanography Ltd. to outline the oxygen budget with special reference to the effect of dumping dredge spoil within the basin. Despite the annual variability of oxygen levels in the deeper water, and the lack of adequate data in some respects (current measurements for advection estimates, for instance) it was apparent that dumping does not affect the deep-water oxygen regime provided that the area covered by dredge spoil is not significantly changed. It was recommended that in situ oxygen determinations at the undisturbed sediment-water interface would give the best estimate of bottom oxygen uptake.

5. Underwater coring techniques for areas with extensive wood debris

In order to obtain an Ocean Dumping permit, the proponent is obliged to obtain core samples at the dredge site for analysis, and in a significant number of instances some difficulty is experienced in obtaining cores where wood waste has accumulated. A contract was let to B.H. Levelton and Associates Ltd. to investigate the availability of a suitable technique. This report is not, therefore, directly related to those discussed above. The required cores have a minimum dimension of 5 cm diameter, 5 m length, obtainable in waters less than 20 m deep. After extensive review of the requirements and the available techniques, the report concludes that two basic approaches have the greatest potential for meeting the sampling requirements:

(a) conventional drilling with surficial sediment stabilization -

-after initial stabilization of the organic surface mat by grouting, temporary consolidation or freezing, the mat is drilled and sampled by rotary or auger drilling techniques, preferably with a high speed sawing action. The underlying sediment is then sampled by down-hole thin-walled tube samplers with core retainers.

-considerable success could be expected after perfection of the technique for organic stabilization. However, the method requires a well-anchored surface vessel and expensive equipment.

(b) two component system

-a vibrating piston corer or vibrocorer could be used to penetrate and sample the entire profile, using the largest practical core diameter. The surficial mat could be sampled by large diameter gravity or box corer if the first samples proved to be disturbed.

-the vibrocorer alone would probably suffice in areas with minimal or small diameter debris. The method is more flexible and less costly than the former.

Trials of these two methods are suggested.

B. HEAVY METALS STUDIES

The heavy metals study summaries are divided into mercury and general heavy metals subcategories. The mercury studies were performed on Howe Sound sediments while the heavy metals study originated from the Point Grey dumpsite. The studies conducted by the respective contracted consultants are as follows:

1. Howe Sound sediment collection and analysis for mercury (Chemex Labs Ltd.).

2. Mercury mobilization from resuspended dredge spoils in Howe Sound (Seakem Oceanography Ltd.).

3. Biotransformation of inorganic mercury to organomercurials in Mamquam Channel sediments (Willis, Cunliffe, Tait & Co. Ltd.).

4. Heavy metals in marine benthic organisms at the Point Grey dumpsite (Cantest Ltd.).

(i) Howe Sound Mercury Mobilization and Biotransformation Studies

In 1965, FMC Canada Ltd. began production of chlorine and caustic at a plant located at the head of Howe Sound (Fig. 4). Use of the mercury cathode process resulted in a continuous loss of mercury both to the atmosphere and to the estuarine waters.

No record of mercury losses was kept until 1970 when the first B.C. Pollution Control Branch licence was issued. Evidence from other chlor-alkali plants shows that a reasonable estimate for mercury loss was about 0.15 Kg/tonne of chlorine produced during that time period. At a production rate of around 136 tonnes of chlorine per day, mercury releases were about 20 Kg/day.

In 1970 highly elevated mercury levels were found in the indigenous benthic fauna of upper Howe Sound and, as a result, Environmental Protection Service issued new and stringent effluent regulations to the chlor-alkali industry in 1972. "Acceptable" mercury discharge was decreased from 0.15 Kg/tonne Cl_2 to no more than 0.007 Kg/tonne Cl_2.

All losses were to be monitored daily and reported to Environmental Protection Service monthly. Actual daily losses (EPS, 1972) were found to be below allowed levels, often less than 0.5 g/tonne Cl_2. Mercury losses, therefore, have been decreased from 20 Kg/day to about 0.07 Kg/day since 1972.

Despite a dramatic reduction in effluent mercury discharge, high sediment mercury levels were still being recorded in 1973 adjacent to the FMC outfall and in deep water 4 km to the south (Thompson and McComas, 1973). The following studies were therefore initiated to further monitor sediment mercury levels in Howe Sound, determine the likelihood of mercury mobilization by sediment dredging and dumping activity, and examine mercury biotransformation by Howe Sound benthic microbiota.

1. Howe Sound sediment collection and analysis for mercury

Sediment cores were taken by Chemex Labs. Ltd. at 29 stations, manually on tidal flats adjacent to the FMC chlor-alkali plant and remotely in the Squamish River, Howe Sound and Georgia Strait (Fig. 4).

Sediments located above the FMC plant and below in Howe Sound and Georgia Strait were uniformly low in mercury at levels generally below 0.1 μg/g dry weight. A region of buried mercury was twice measured at Watts Point, 5 km south of FMC beneath 4 cm of cleaner sediment. Other "hot spots" may exist in Howe Sound as sampling in this area was sparse. In the vicinity of the FMC plant at the Squamish estuary mercury levels were elevated, frequently above 1 μg/g dry weight to an extreme of 8 μg/g off the FMC loading dock. A mercury loading profile for each of the four sampling regions is shown in Fig. 5. Mercury levels were always found to increase from the west to east shore, likely a result of current and bottom sediment flow patterns.

2. Mercury mobilization from resuspended dredge spoils in Howe Sound, B.C.

Mercury laden sediments taken in the previous study around the FMC plant in Squamish estuary were suspended in seawater and monitored for mercury release into the water. A rapid release of up to 30% of the bound mercury was measured directly after suspension. Most of the mobilized mercury recombined with the sediment after 24 hours (see Fig. 6). The magnitude and rate of release was greatest at low pH and high salinity.

In a static release experiment, mercuric chloride solution was injected 10 cm below the sediment-seawater interface of a Howe Sound

sediment core. 96% of the mercury migrated out of the core, suggesting that binding agents (to adsorb, precipitate or complex the Hg ion to the sediment) were absent.

In situ mercury mobilization in Squamish estuary sediments was briefly examined and shown to oscillate with the tides to 10-20 times Howe Sound background level.

Prediction of mercury mobilization from dredge spoil would depend on the ionic strength, pH, salinity and organic content of seawater and the particulate structure of the sediment. It is suggested that steady state release of mercury from Howe Sound sediment might range from 100 to 1000 µg/g dry weight with 1% of the bound mercury being remobilized by dredging. The net result would be a redistribution of less concentrated mercury over a larger area.

3. Biotransformation of inorganic mercury to organomercurials in Squamish estuary sediments

The degree of methylation of mercury by bacteria in Howe Sound sediments was monitored by Willis, Cunliffe, Tait & Co. Ltd. High levels of both mercurials were measured around the FMC plant and Woodfibre pulp mill, particularly in the latter case 10-12 cm below the sediment surface. Methylmercury levels generally comprised less than 1% of the total mercury present.

Sediment samples incubated in the lab were spiked with 10 and 100 µg/g of mercury and the rate of methylation observed (Figs. 7 and 8). When 10 µg/g mercury was added (Fig. 7) methylation rapidly increased until a maximum quasi-steady state was reached at 10 days. After 25 days incubation methylmercury levels dropped, possibly by breakdown. Production occurred in the absence of oxygen, albeit in lower quantity. With the addition of 100 µg/g of mercury (Fig. 8) methylation was increased but not in proportion to the quantity of substrate available. This may be due to a degree of toxification of the bacteria or indicate that a production maximum was reached.

A comparison with literature of worldwide sources indicated that Howe Sound sediment was comparable in methylating ability. It is apparent that methylating bacteria are a pathway for mercury transfer from sediments to the marine food web.

(ii) Heavy Metals in Marine Benthic Organisms at the Point Grey Dumpsite

The Point Grey dumpsite (Fig. 9) is the largest dredgeate disposal area in Canada. Active since 1969, the 5 km^2 area serves disposal from the Fraser River North Arm, Vancouver Harbour and adjacent areas. Dredgeate from the False Creek area was known to contain heavy metals and a study was instigated by Can Test Ltd. to examine the transfer into benthic organisms of zinc, copper, lead, chromium, cadmium and mercury.

The holothurian *Molpadia intermedia* was selected for tissue analysis because of its relatively large size and abundance. Organisms were collected by Smith-McIntyre grab from the contaminated northeast quadrant of the dumpsite (Fig. 9) for comparison with organisms of uncontaminated Georgia Strait sediment.

Ectoderm and muscle strips were sampled for heavy metals content, although the latter tissue was preferred for analysis as it was less likely to be contaminated by sediment.

Insufficient sample precluded analysis for mercury. Results for the other 5 heavy metals were variable and because too few test organisms were available in the control area, statistical analysis could differentiate no significant difference in heavy metals content between the Point Grey dumpsite and Georgia Strait organisms.

III. REFERENCES

Bell, W.H. 1976. The Exchange of Deep Water in Alberni Inlet. Pacific Mar. Sci. Rept. 76-22. Institute of Ocean Sciences, Patricia Bay. Unpub. ms. 19 pp.

Brinkhurst, R.O. (ed.). 1976. Proceedings of the Workshop on Ocean Dumping Investigations. Institute of Ocean Sciences, Patricia Bay. Unpub. ms. 28 pp.

Canada. Department of the Environment. Environmental Protection Service, Water Pollution Control Directorate. 1972. Chlor-Alkali Mercury Regulations, Regulation Codes and Protocol Report. EPS-1-Wp-72-3. Ottawa, Ont. 5 pp.

Harbo, R.M. and I.K. Birtwell. 1977. Mercury content of some organisms from coastal waters of southern B.C. Canada. Department of Fisheries and the Environment. Fisheries and Marine Service, Pacific Region. Tech. Rept. PAC/T775. Vancouver, B.C. 24 pp.

Thompson, J.A.J. and F.T. McComas. 1973. Distribution of Mercury in the Sediments and Waters of Howe Sound, British Columbia. Fish. Res. Board Can. Tech. Rept. 396. 31 pp.

IV. FIGURES

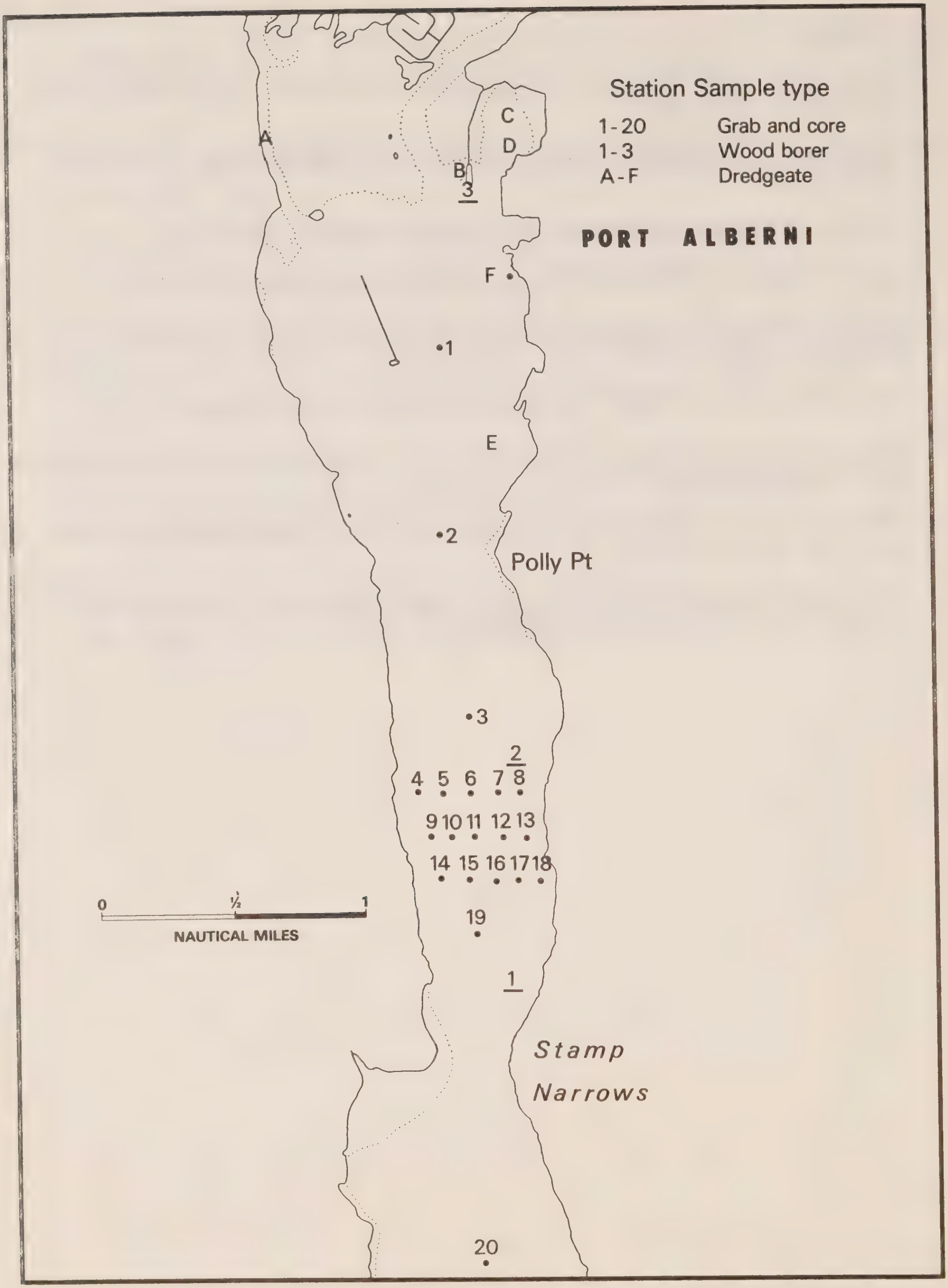

Fig. 1. Grab, core, wood borer and dredge sampling stations in the upper basin of Alberni Inlet, B.C.

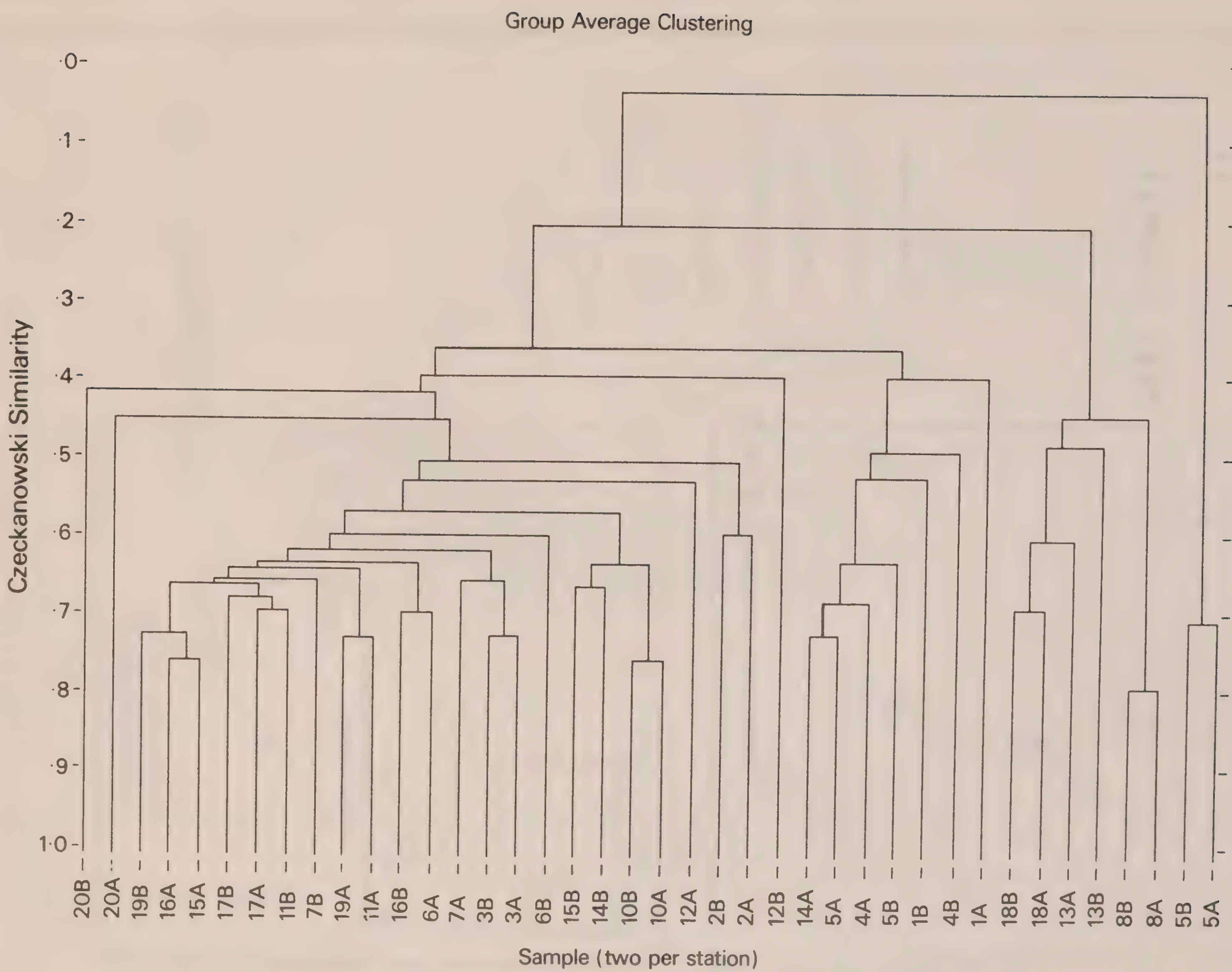

Fig. 2. Dendrogram generated by cluster analysis of grab samples from Alberni Inlet, B.C.

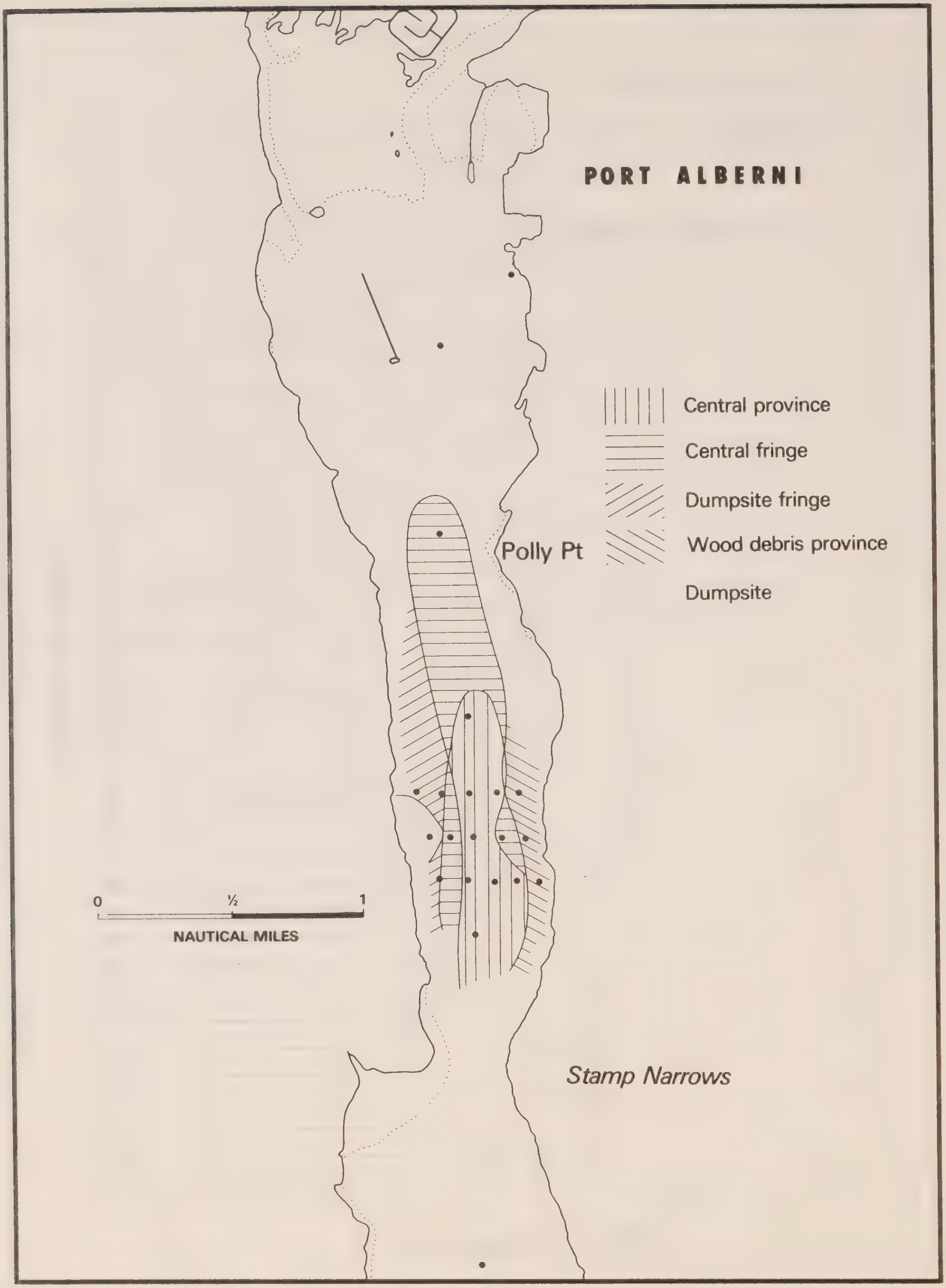

Fig. 3. Biotic provinces as deduced from cluster analysis in Fig. 2.

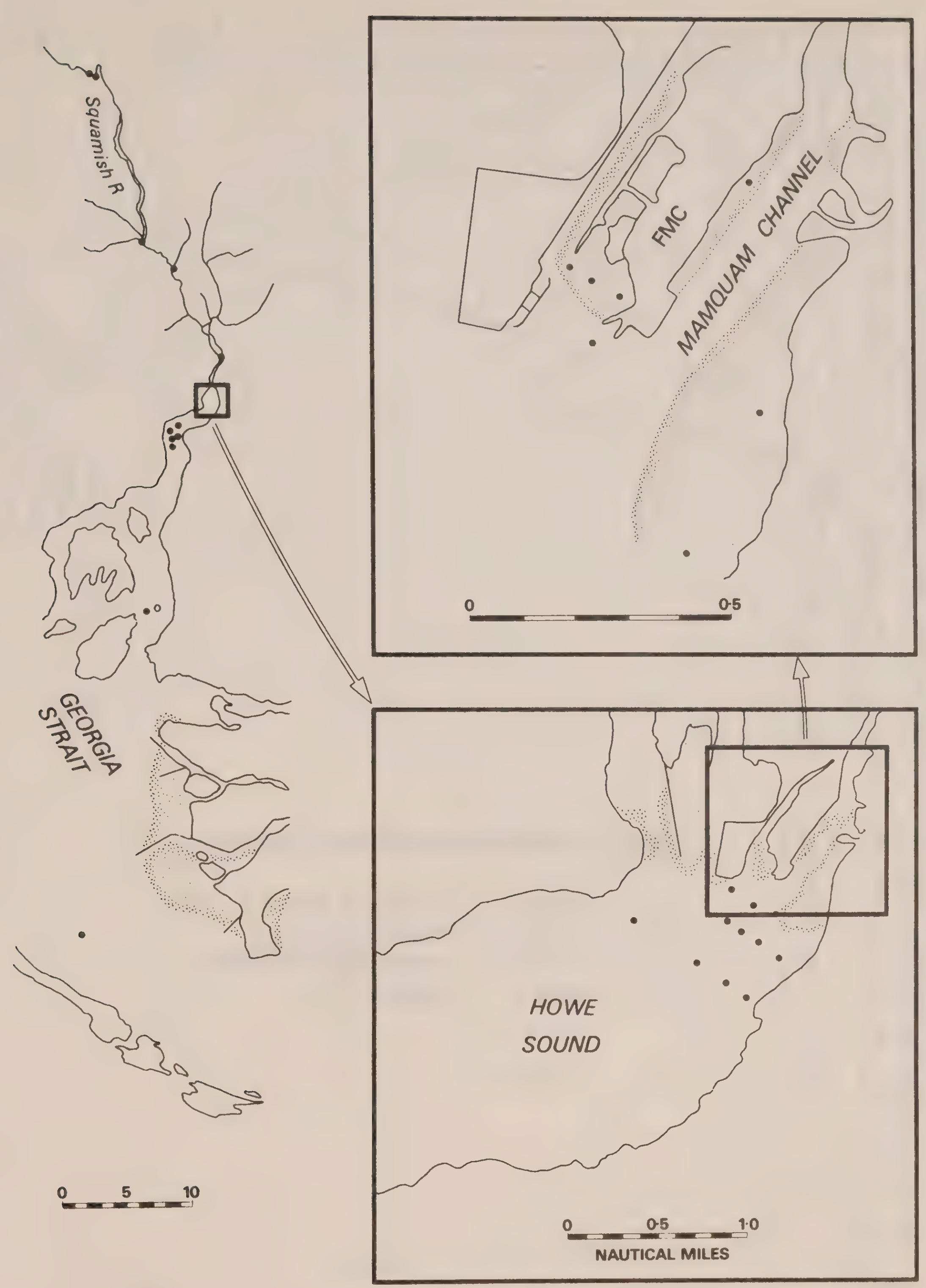

Fig. 4. Coring stations for sediment mercury analysis, Howe Sound, B.C.

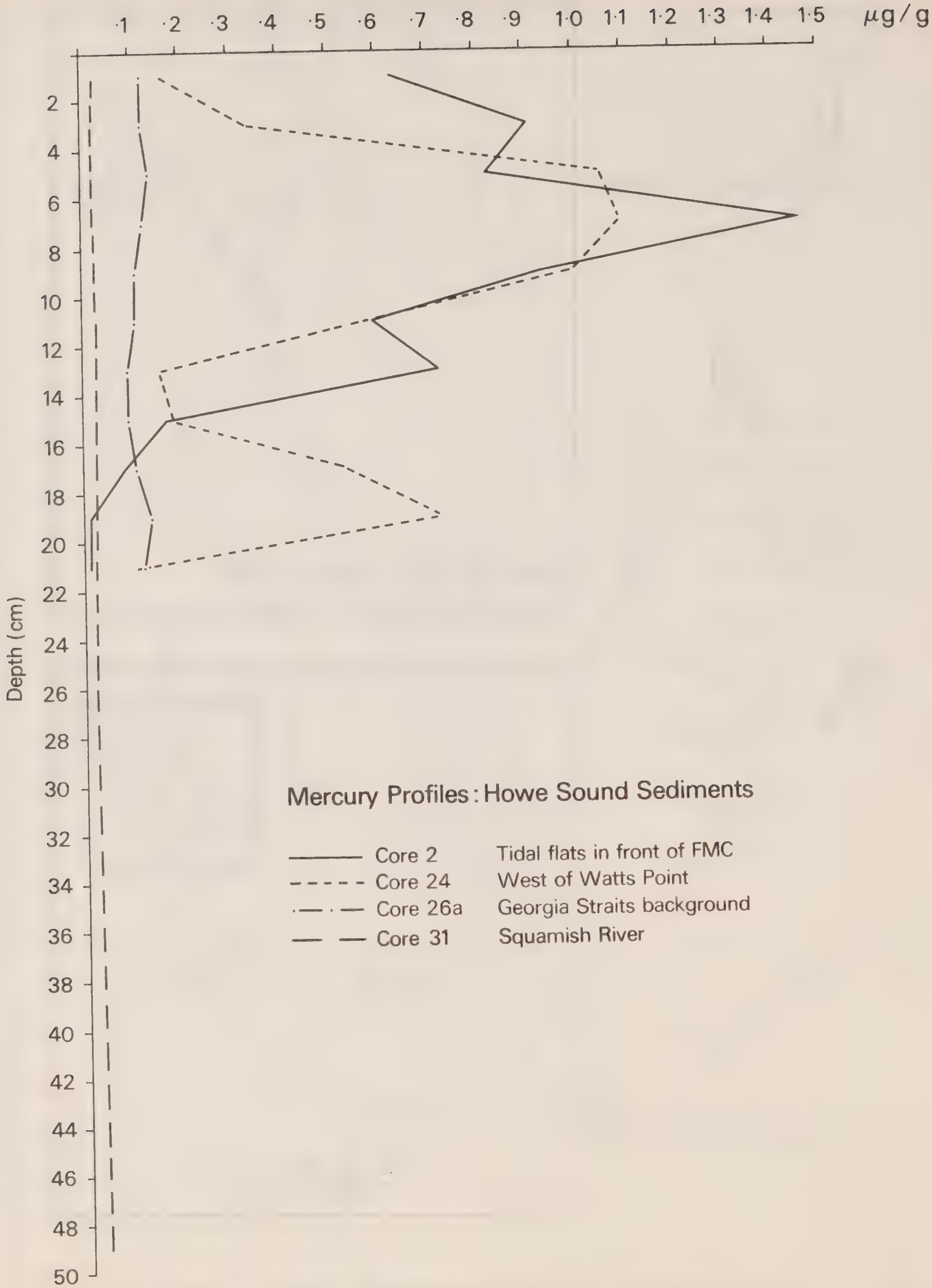

Fig. 5. Depth profiles for mercury in four representative cores taken in Fig. 4.

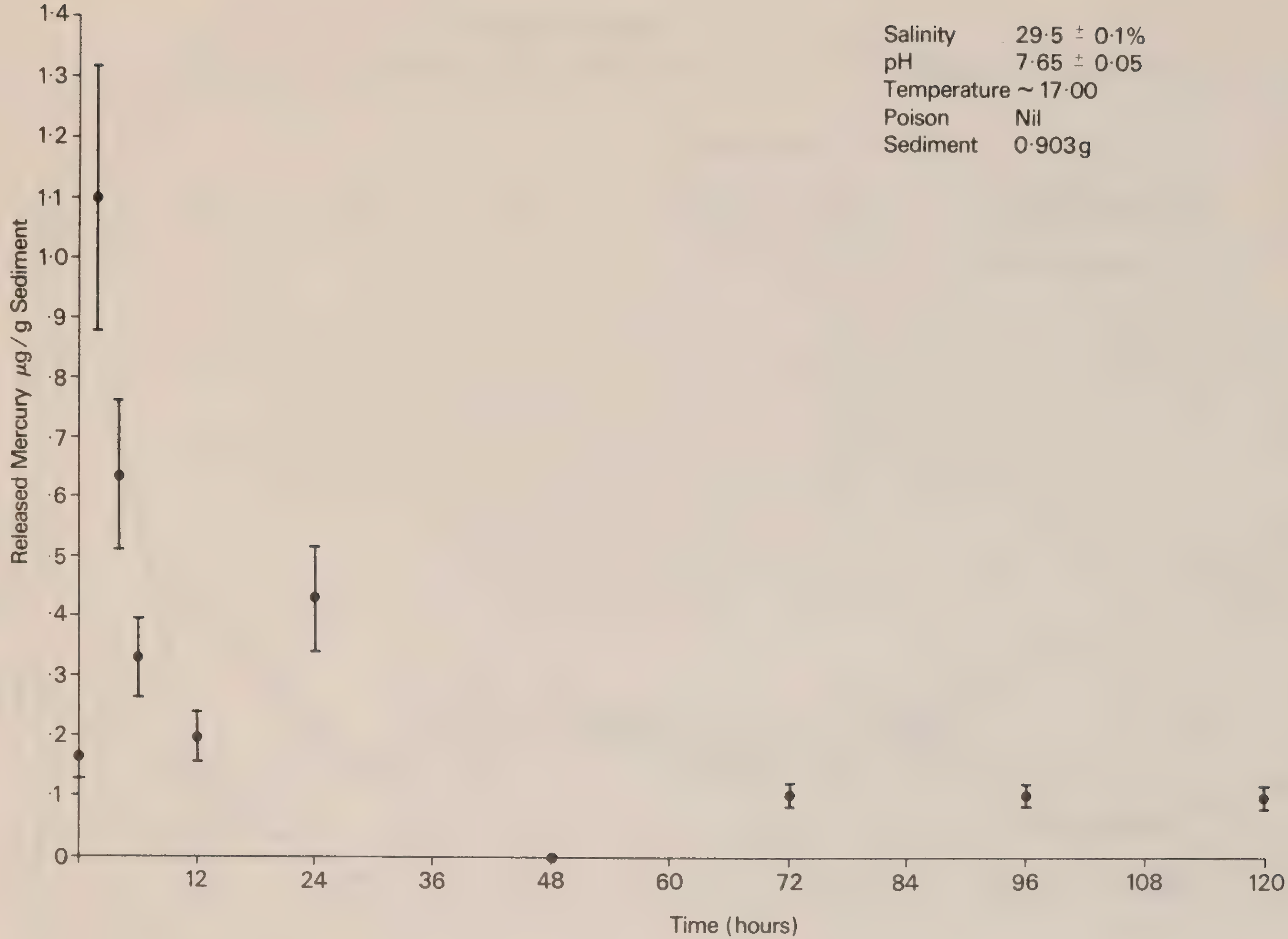

Fig. 6. Rate of mercury release from submerged Howe Sound sediment.

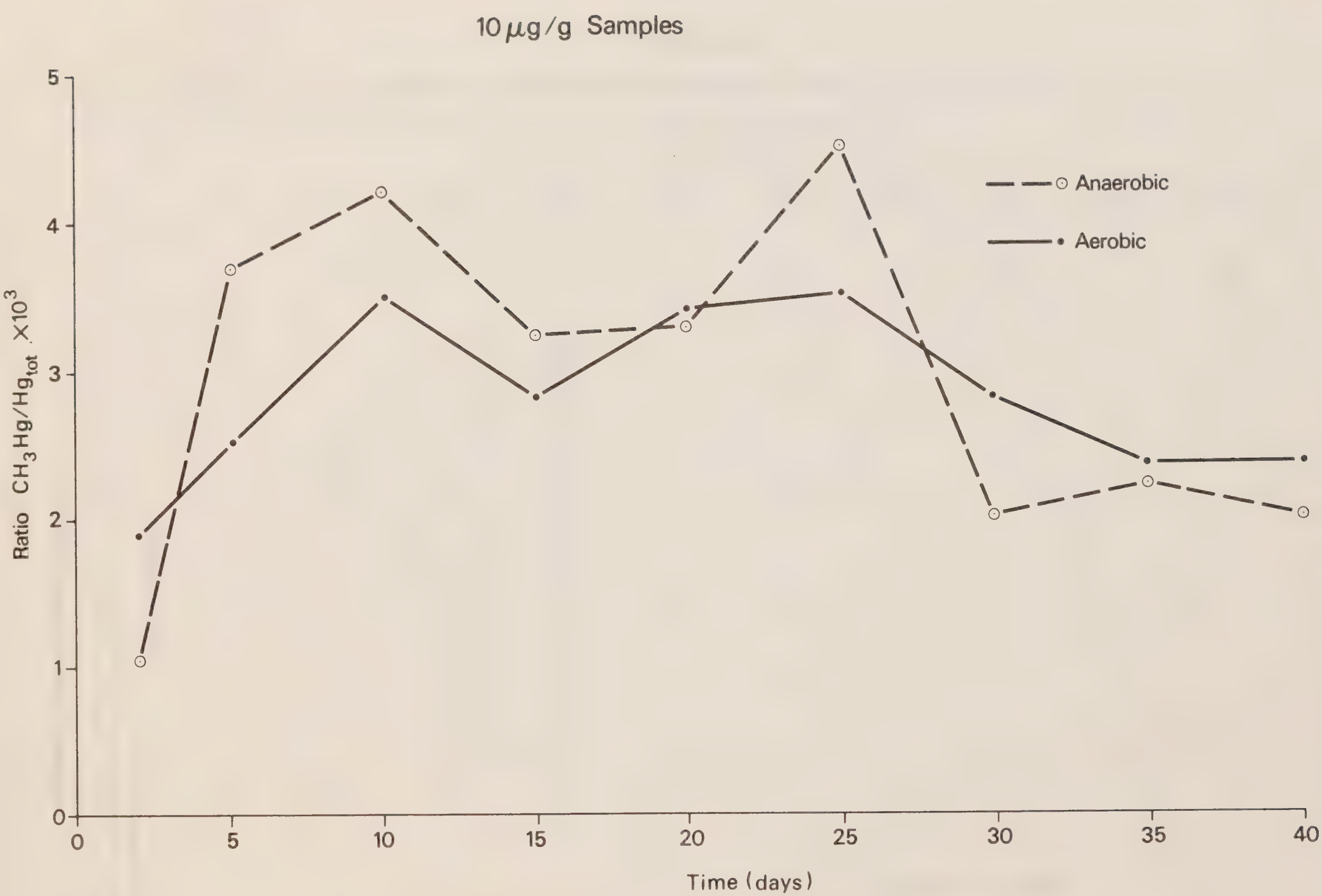

Fig. 7. Time course of methylmercury production in Howe Sound sediment spiked with 10 μg/g mercury.

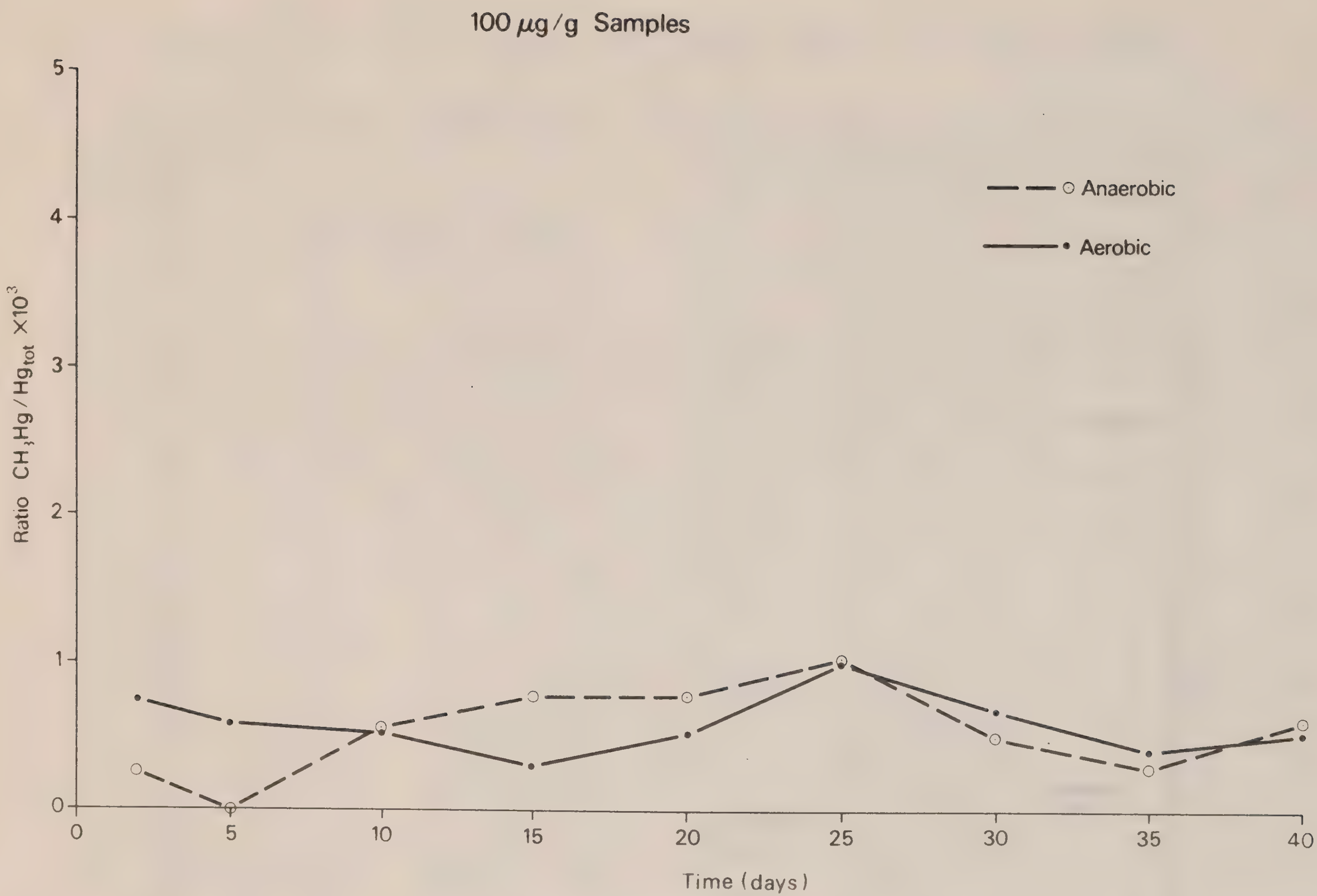

Fig. 8. Time course of methylmercury production in Howe Sound sediment spiked with 100 μg/g mercury.

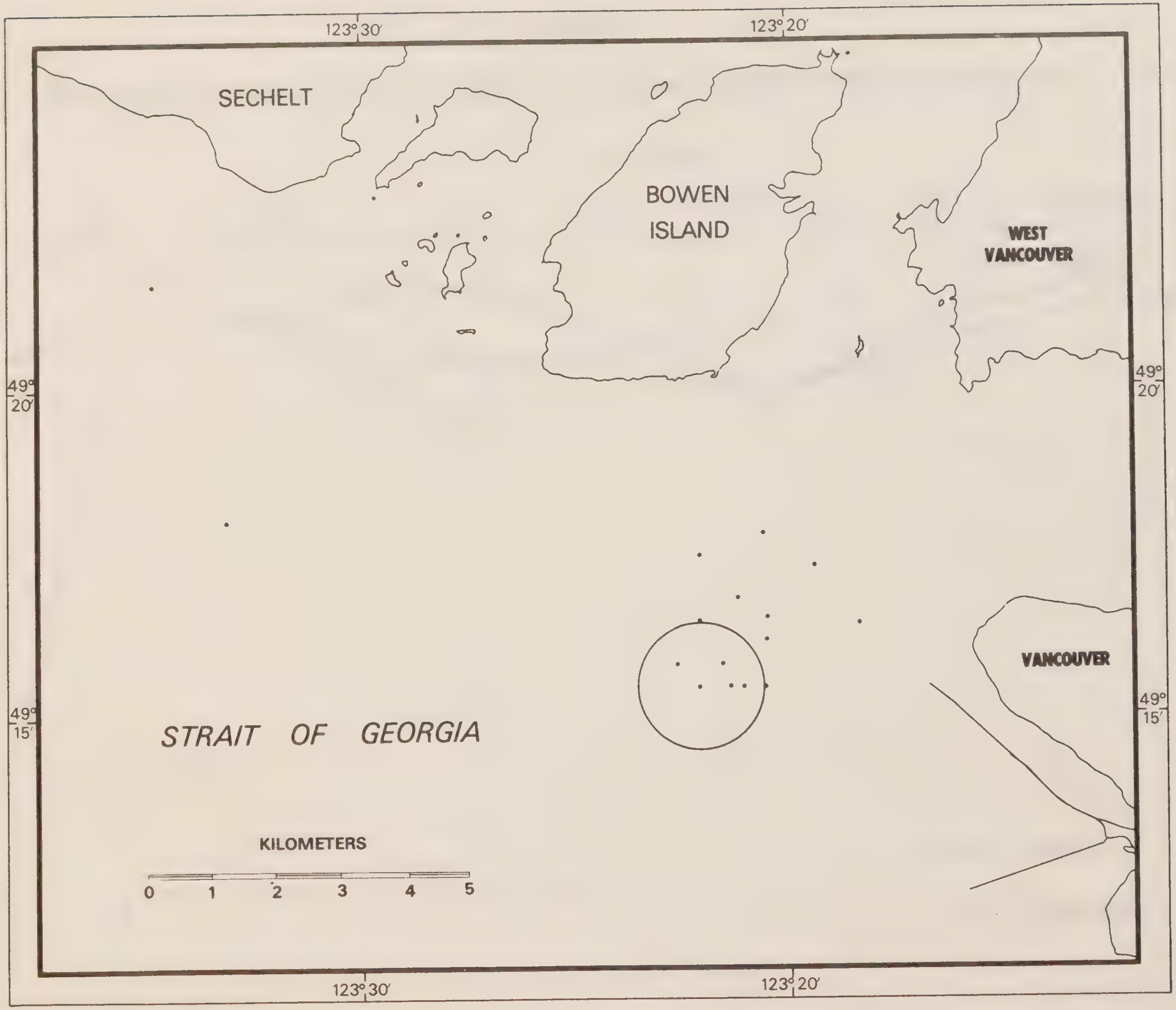

Fig. 9. Grab sampling stations at the Point Grey dumpsite for analysis of heavy metals in *Molpadia intermedia*.

V. OCEAN DUMPING WORKSHOP RECORD

(Institute of Ocean Sciences, Patricia Bay, Sidney, B.C., May 30 and 31, 1977)

The Ocean Dumping Workshop was held on May 30 and 31, 1977 to discuss the 1976-77 contract reports and review current studies. New topics of research were formulated and discussion generated on pathways for future ocean dumping impact assessment.

A. WOOD WASTE STUDIES (May 30, 1977)

Present: Dr. R. Brinkhurst (OAS), Mr. B.De L.Boom (Seakem), Dr. J. Davis (FM), Dr. G. Vigers (EVS Consultants), Mr. R. Smith (OAS), Dr. H. Rogers (FM), Dr. P. Thomas (Econotech Services Ltd.), Dr. P. Nasmyth (OAS). Mr. W. Bell (OAS), Dr. M. Waldichuk (FM), Mr. R. Hoos (EPS), Ms. J. Landucci (EPS), Mr. D. Paton (OAS), Dr. R. Macdonald (OAS), Dr. E. Anderson (Dobrocky SeaTech), Mr. B. Potter (Willis, Cunliffe, Tait), and Dr. C. Levings (FM).

Dr. Rogers opened discussion by reviewing the terms of reference for the contract with Econotech, which addressed itself to (a) the acute effects of dumping wood waste, (b) analyses of field samples from Alberni, in support of biological sampling. Discussions and comments were as follows:

In spite of extensive wood waste dumping in years past, according to results from grab sampling, there has been no noticeable increase in fibre content around the dump site. This may be because dumping of inorganic material (gravel, sand) has resulted in a "club sandwich" situation or because wood fibre disperses completely when dumped. Since O_2 uptake is very dependent on fibre content, it was suggested that a (visual?) test for fibre be included as a criterion for dumping permits. Fibre content was felt to be as least as important as the "10% volatile solids" rule (Levings, Brinkhurst, Waldichuk).

Some concerns were raised regarding the design of the lysimeter work: (1) no replication was employed, (2) arguments about field vs lab approaches. In defence of the lysimeters, the correspondence between O_2 uptake measured in them and in situ respiration data was noted. The lysimeter work was compared to bioassays, where static, partial replacement, and flow-through techniques can be employed. The decision to use one or the other depends on questions asked and resources available. Chemical measurements in overlying vs interstitial water required quite different approaches, and in order to determine which direction further chemical studies should take, a re-assessment of biological impact is required - are we interested in infauna or epifauna? (Davis, Thomas, Rogers).

Dr. Davis introduced a presentation of results of the bioassay work, which tested the toxicity of "effluents" from lysimeters at Econotech. Standard protocols were followed wherever possible but arbitrary decisions were required at several points especially when attempting tests for sulfide toxicity with species requiring moderate levels of dissolved oxygen. Dr. G. Vigers (EVS Consultants) then presented results of the bioassay contract.

Results were of mixed quality but did show that sediments from dredge sites in the upper Alberni Inlet basin were toxic to shrimp (*Crangon* sp., primarily *C. communis*) and stickleback (*Gasterosteus aculeatus*). Because of the difficulties in learning to use shrimp for marine bioassays, a return to "standard" species (rainbow trout) was advocated. Extensive European experience with *Crangon crangon* was described and found lacking in definitive information on various test regime variables (dissolved oxygen, pH, temperature, loading density, sex and parasitism, for example). Because of the chemical uncertainties in the work the decision to use a reference toxicant was applauded (Brinkhurst, Waldichuk, Thomas).

Dr. Levings introduced the general scheme of contract research dealing with effects of spoil disposal on benthic communities in Alberni Inlet. The contract also provided for collection of field samples used in the chemical and bioassay work (see above). Part of this research, which was jointly planned with Dr. Brinkhurst, involved measurements of sea-bed respiration (community metabolism). A contract to prepare a tentative oxygen budget (based on existing data) for bottom waters of Alberni was prepared by Seakem Oceanography Ltd. The Seakem contract was let in response to a proposal, identified in December 1976, to move the dump site to Nahmint Bay, presumably to achieve better dilution of the oxygen-demanding dredge spoils.

Results were then presented by Dr. E. Anderson representing Dobrocky Seatech Ltd. and Mr. B. deL. Boom representing Seakem. The presentations were supplemented by underwater photographs at the dump site, obtained as part of the required monitoring programme conducted under the auspices of MacMillan-Bloedel.

A number of issues were raised concerning the field studies at Alberni. It was noted that community respiration at low ambient oxygen levels should be viewed with caution, as there is a functional response between O_2 availability and respiration. In Alberni, where oxygen values vary seasonally for natural reasons, temporal changes in community respiration would be expected, and should be considered in any budget. Comparisons were made with relative effects of oxygen demand of log boom debris vs dump site sediments, considering the vast acreages of log debris in the inlet. Large chunks of wood would not be expected to have great O_2 demand because of surface to volume relationships, however. The usefullness of BOD_5 measurements was questioned, especially as this measurement has been withdrawn as standard method. Measurement of O_2 change using flux in redox potential was suggested as an alternative technique (Davis, Hoos, Macdonald, Waldichuk).

Results of monitoring studies conducted by MacMillan-Bloedel as a requirement for their dumping permit were reviewed by Mr. Hoos. The underwater photos showed that the number of burrows (presumably created by infaunal benthos) was reduced in the vicinity of the dump site. These observations were corroborated by independent observations made by EPS personnel from the Pisces IV submersible. There was no significant difference between BOD_5 measurements from material cored before and after dumping, nor in percent volatile solids. There was a slight reduction in dissolved O_2 in bottom waters but once again this was not statistically significant (data resulting from the monitoring programme were stored in RODAC files).

The day's proceedings were rounded off by Dr. Brinkhurst, who concluded (in the form of a "challenge") that there was no evidence of severe environmental damage at the present Alberni dump site - at least not enough to merit moving the disposal area to Nahmint Bay. It was pointed out, however, that the new permit allows for greater range in the nature of disposal material. Have we adequately addressed this problem in a predictive sense? Most present thought not, and the consensus was that Alberni should be used as a site for experiments to try and improve our predictive tools.

Discussion ensued on how predictive capability might be improved. Dr. Waldichuk thought that differences in productivity had to be assessed at dumpsites. Drs. Brinkhurst and Levings agreed but pointed out that marine ecosystems are complex and measuring productivity of the dominant benthos may not provide data on the quality of the production, i.e. which resource is the energy flowing through? Ecosystem studies were advocated - techniques suggested included laboratory microcosms, CEPEX bags, artificial substrates set out in the field, and full-fledged field experiments. Oxygen budgetting or models involving oxygen flux were also advocated as useful predictive tools. They also noted that community analyses, except for the concepts of indicator species and/or assemblages, had limited predictive value, but were useful in monitoring. At Alberni and elsewhere the amount of "background noise" in the community (e.g. natural, seasonal change in community structure) needs to be assessed before a proper benthic monitoring programme can be established.

Some discussion involved future work at Alberni that should be the responsibility of MacMillan-Bloedel. Most participants felt that more work by the company should be requested only if the company proposes a major change in dumping strategy. Dr. Waldichuk pointed out that the company could not be expected to address general or basic questions such as how does the benthos at dump sites relate to commercial species? Dr. Brinkhurst questioned whether RODAC should fund studies on this topic, as it could be viewed as a "pure Fisheries" role.

B. HEAVY METALS STUDIES (May 31, 1977)

Present: Dr. R. Brinkhurst (OAS), Dr. B. deL. Boom (Seakem), Mr. R. Hoos (EPS), Mr. D. Paton (OAS), Mr. B. Potter (Willis, Cunliffe Tait), Dr. R. Macdonald (OAS), Ms. J. Landucci (EPS), Dr. M. Waldichuk (FM), Dr. E. Anderson (Dobrocky Seatech), Dr. W. English (Plumper Products), Dr. C. Levings (FM) and Mr. R. Smith (OAS).

Dr. Macdonald opened the day's proceedings with a report on the data screening exercise performed by Seakem Ltd. with information from the Point Grey dumpsite (obtained in January 1976). A cursory review of the data showed no marked changes from results reported in last year's workshop. Dr. Brinkhurst suggested that the data be published, even in raw tabular form, so that others could use them. An enquiry was directed to Dr. Wong on this matter.

Mr. Paton reported on the heavy metal analyses conducted with muscle tissue from *Molpadia intermedia* (sea cucumber) from the Point Grey dumpsite and a control area (Can Test Ltd.). The material was collected in a joint cruise (Drs. J.A.J. Thompson and C.D. Levings) to the Strait of Georgia in March 1976. Further sampling is necessary to provide enough material for adequate statistical analyses.

Dr. Macdonald reported on contracts dealing with: (a) mercury levels (inorganic and organic forms) from field surveys in Howe Sound (Chemex Ltd.), (b) mobilization of mercury from sediments (laboratory studies and field work at Squamish (Seakem). Mr. Paton reported on biotransformation studies of inorganic mercury in estuarine sediments (Willis, Cunliffe and Tait).

Discussion and commentary on the chemical work was limited. A concern was noted regarding bioaccumulation of mercury in organisms, even though the "conversion efficiency" to methylmercury was low. A recent FM report by Harbo and Birtwell was referred to. Two major issues regarding interpretation of the field chemical data were raised:

(1) what is the burial rate of contaminated sediments in Howe Sound?

(2) aliasing problems re sampling over tidal cycles.

C. OTHER PROJECTS (May 31, 1977)

A training manual being prepared by a contract worker was reported by Mr. Hoos to be in draft form awaiting further revision. The report contains a review of the Ocean Dumping Control Act (including international implications), procedures for sample collections in legal cases, and guidelines for the conduct of inspectors.

Mr. Smith presented a feasibility study made by Canadian Aircraft Products for obtaining benthic cores from the submersible Pisces IV. A rack of 6" cores, driven into sediment by electric motors, was proposed

as the best method. Design and fabrication costs were estimated at $30,000.

A review of coring techniques for sediments rich in wood debris was made by B.H. Levelton and Associates but was not available at the time of the workshop. Recommended coring apparatus and methods are summarized in Section II of this report.

D. CONCLUSIONS AND RECOMMENDATIONS

The remainder of the Workshop was a free-wheeling discussion on topics for new work. Concern was expressed about water column effects and landfill problems (an alternative to ocean disposal) by Dr. English. Dr. Waldichuk felt that food chain effects should be investigated more thoroughly, especially the impact of dumping on calanoid copepods overwintering in deep waters of the Strait of Georgia. A basic question here is: is deeper better? <u>or</u> is dilution the solution? Mr. Hoos enquired about dredging effects and regulations on dredging <u>vs</u> ocean dumping. This issue presents special conflicts since the companies involved in dumping are often dredging.

The workshop closed with a request from Drs. Brinkhurst and Waldichuk that the Technical Sub Committee meet to propose studies for funding in 1977-78.

VI. APPENDICES

APPENDIX 1. 1976-77 CONTRACT REPORTS

A. Wood Waste Studies

* The effects of dumping dredge spoils containing wood debris on benthic communities in Port Alberni, B.C.

Scientific Authority - C.D. Levings (PEI)

Contractor - Dobrocky Seatech Ltd.
130 Kingston Street
Victoria, B.C. V8V 1V4 $32,130

* A study of the characteristics of Alberni Inlet dredge spoils rich in wood waste and the predictive value of pre-dump analyses.

Scientific Authority - H. Rogers (PEI)

Contractor - Econotech Services Ltd.
852 Derwent Way
Annacis Island
New Westminster, B.C. $11,070

* Study of the toxicity of leachates from dredge spoils containing wood waste.

Scientific Authority - J. Davis (PEI)

Contractor - EVS Consultants Ltd.
204 Blue Mountain Street
Coquitlam, B.C. V3K 4H1 $ 8,147

* An oxygen budget for the bottom waters of Alberni Inlet.

Scientific Authority - C.D. Levings (PEI)

Contractor - Seakem Oceanography Ltd.
560B Alpha Street
Victoria, B.C. $ 2,000

* Investigation of underwater coring techniques for areas with extensive wood debris.

Scientific Authority - G.R. Smith (OAS)

Contractor - B.H. Levelton & Associates, Ltd.
1755 West 4th Avenue
Vancouver, B.C. V6J 1M2 $ 8,000

Photographic documentation at selected dump sites (project carried over from 1975).

Scientific Authority - C.D. Levings (PEI)

Contractor - Dobrocky Seatech Ltd.
130 Kingston Street
Victoria, B.C. V8V 1V4 $ 1,100

B. Heavy Metals Studies

* Howe Sound mercury mobilization study: sediment collection and analysis.

Scientific Authority - C.S. Wong (OAS)

Contractor - Chemex Labs Ltd.
212 Brooksbank Avenue
N. Vancouver, B.C. V7J 2C1 $ 4,762

Core samples from Mamquam Channel.

Scientific Authority - R. Hoos (EPS)

Contractor - B.C. Research
3650 Westbrook Crescent
Vancouver, B.C. $ 1,650

* Study of mercury mobilization from resuspended dredge spoils in Howe Sound.

Scientific Authority - C.S. Wong (OAS)

Contractor - Seakem Oceanography Ltd.
560B Alpha Street
Victoria, B.C. $21,514

* Study of biotransformation mercurials in estuarine sediments.

Scientific Authority - J.A.J. Thompson (OAS)

Contractor - Willis, Cunliffe, Tait & Co. Ltd.
827 Fort Street
Victoria, B.C. V8W 1H6 $ 8,900

* Study of heavy metals in marine benthic organisms (*Molpadia intermedia*) at Point Grey Dumpsite.

Scientific Authority - J.A.J. Thompson (OAS)

Contractor - Can Test Ltd.
1650 Pandora Street
Vancouver, B.C. V5L 1L6 $ 2,100

Evaluation of additional data from Point Grey Dumpsite.

Scientific Authority - C.S. Wong (OAS)

Contractor - Seakem Oceanography Ltd.
560B Alpha Street
Victoria, B.C. $ 2,357

C. Other Projects

* Ocean Dumping Training Manual.

Scientific Authority - R. Hoos (EPS)

Contractor - Valerie Bradshaw
1310 Cypress H.
Vancouver, B.C. $ 4,500

* Design of a benthic corer for Pisces IV.

Scientific Authority - G.R. Smith (OAS)

Contractor - Canadian Aircraft Products
261 Viscount Way
Richmond, B.C. $ 5,590

Ocean Dumping Models and Technology.

Scientific Authority -	D. Farmer (OAS)	$ 3,000
	TOTAL:	$116,820

* Summarized in this report.

APPENDIX 2. 1977-78 CONTRACTS.

A. Biology

Ref. DSS File No. 08SS. KF833-7-1210 $27,000

Marine biological sampling and observations of temporal changes in benthic communities and benthic respiration at a dump site in Port Alberni.

Scientific Authority - C.D. Levings (PEI), R.O. Brinkhurst (OAS)

Contractor - Beak Consultants Ltd.

Contract Amendment to 0SS76-02122

RN KF832-6-0873-FC, 2-03-3140-711-0432 $ 6,200

(Addition to 1976-77 contract to study leachates from dredge spoils containing wood waste.)

Additional sampling and analysis required.

Scientific Authority - H. Rogers (PEI)

Contractor - Econotech Services Ltd.

B. Chemistry

Ref. DSS File No. 08SS. KF833-7-1271 $ 9,000

Collection and analysis of seawater and undisturbed sediment cores in Alberni Inlet.

Scientific Authority - R.W. Macdonald (OAS)

Contractor - Chemex Labs. Ltd.

Ref. DSS File No. 08SS. KF833-7-1269 $ 5,500

Variability in analytical results on dredged spoils and marine sediment in connection with the validity of presently prescribed criteria.

Scientific Authority - R.W. Macdonald (OAS)

Contractor - Chemex Labs. Ltd.

Ref. DSS File No. 08SS. KF833-7-1277 $ 4,000

Analytical support for a study of mercury biotransformation in anoxic estuarine sediments.

Scientific Authority - J.A.J. Thompson (OAS)

Contractor - Willis, Cunliffe, Tait & Co. Ltd.

C. Physics

Ref. DSS File No. 08SS. KF833-7-1367 $22,000

Oxygen budget studies in Alberni Inlet.

Scientific Authority - W.H. Bell (OAS)

Contractor - Dobrocky Seatech Ltd.

D. Administration

Ref. DSS File No. 08SS. KF832-7-1004 $ 6,200

To review and record activities relating to ocean dumping on the west coast.

Scientific Authority - R.O. Brinkhurst

Contractor - K.E. Conlan

E. Additional Studies

Carryover from 1976-77 fiscal year	$ 3,350
TOTAL:	$83,250

APPENDIX 3. LOCATIONS OF SCIENTIFIC AUTHORITIES

EPS

Environmental Protection Service
Kapilano 100, Park Royal
West Vancouver, B.C. V7T 1A2

FM

Water Quality Division
Habitat Protection Directorate
Fisheries and Marine Service
Vancouver, B.C.

OAS

Institute of Ocean Sciences, Patricia Bay
Department of Fisheries and the Environment
9860 West Saanich Road
Sidney, B.C. V8L 4B2

PEI

Pacific Environment Institute
Department of Fisheries and the Environment
4160 Marine Drive
North Vancouver, B.C. V6V 1N6